02.21.02

CERTIFICATE OF EXPRESS MAILING

DATE OF DEPOSIT: February 19, 2002

EXPRESS MAIL NO: EL493161865US

I hereby certify that the foregoing Petition for Correction of National Phase Filing Status for a Patent Application under 37 C.F.R. Section 1.182 for U.S. Patent 10/039,565 (attorney docket no. 717901.20) and related documentation are being deposited with the United States Postal Service, Express Mail, postage prepaid, on the above-identified date, and is addressed to the Assistant Commissioner for Patents, Box DAC, Washington, D.C. 20231

Lori J. Dillon
Lori J. Dillon

STLD01-919420-1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Andrew Mark Stringer)
)
U. S. Patent Application Serial Number: 10/039,565))   Examiner: Unknown.
)
U.S. Filing Date: December 21, 2001)
)   Group Art Unit: 2152
PCT No.: PCT/GB00/02413)
)
International Filing Date: June 21, 2000)
)
Priority Data:)
U.K. Patent No. 9914418.0)
)
For: COMPUTER NETWORK)
PAYMENT SYSTEM)
)
Attorney Docket: 717901.20)

Assistant Commissioner for Patents
Washington, D.C. 20231
Attn: BOX DAC

PETITION FOR CORRECTION OF NATIONAL PHASE FILING
STATUS FOR A PATENT APPLICATION UNDER 37 C.F.R. SECTION 1.182

INTRODUCTION:

     Applicant respectfully petitions for correction to provide U.S. national phase application filing status for the Applicant's patent application (United States Patent Application Serial Number 10/039,565) based on a phone call to Mr. Louis Mora of the Technical Center Group 2100 on February 15, 2002.

STATEMENT OF FACTS:

     Upon a complete failure to receive a filing receipt for Applicant's Patent Application of any kind, Applicant's Attorney, on February 15, 2002 contacted the United States Patent Office to ascertain why this Filing Receipt was not received. Applicant talked to Mr. Mora, who works at the Technical Center Group 2100. Upon Mr. Mora's review of his computer information

associated with the listed Patent Application, Ms. Mora informed Applicant's Attorney that the above listed patent application was still undergoing preexamination processing and was not a PCT national phase patent application. This patent application was considered a bypass continuation patent application since these two alternatives were the only possible alternatives due to the fact that the preliminary amendment that was submitted was not an original patent application and there were no prior co-pending U.S. patent applications.

Applicant is hereby appealing this decision as to the status of Applicant's Patent Application. Applicant's submission was a preliminary amendment that, in the identifying heading on the front page was specifically **addressed to Box PCT** at the **United States Designated/Elected Office (DO/EO/US).** The prior application number along with the examiner and group art unit is listed as "unknown." The PCT Number was listed as PCT/GB00/02413 and the International Filing Date was listed as June 21, 2000. A priority date of June 22, 1999 for a Patent filed in Great Britain was listed. **No priority claim was made to the PCT application** and the one (1) year period for claiming priority under the Paris Convention and 35 U.S.C. Section 119 **expired on June 22, 2000.**

A standard patent application transmittal was inadvertently utilized. However, this transmittal requires **"requisite information"** involving prior applications if Applicant's Patent Application was to be a continuation application and no such information was provided. **The Express Mail Envelope for this entire Patent Application was specifically addressed to Box PCT.**

POINTS TO BE REVIEWED:

1.   When all items required under 35 U.S.C. 371 and 37 C.F.R. Sections 1.494 or 1.495 have been provided within the requisite time period, should the Applicant be unjustly deprived of national phase filing status based on a mere clerical error in utilizing a pre-printed form that merely operated to provide a listing of documents that were mailed together especially when the entire Express Mail package **is specifically sent to Box PCT?**

2.   When there are only two possible types of patent applications that could have been filed, i.e., a bypass continuation application based on a PCT application and a national phase

application based on a PCT application and there are two primary places to receive an indication as to the status of this patent application, i.e., the transmittal document and the identifying heading on the preliminary amendment and both documents clearly negate the possibility of a bypass continuation application, should a bypass continuation application status be conveyed upon the Applicant's Patent Application when it is clearly contrary to the Applicant's intent and the Applicant has not provided the continuation data that is specifically mandated by the United States Patent Office?

3. Should the Applicant, who has filed a complete patent specification with appropriate payment within the requisite time period that fully comports with 35 U.S.C. Section 371, be completely barred from obtaining U.S. national phase filing status based on a mere clerical error, that only involves use of a pre-printed transmittal document, when the United States Patent Office allows for virtually every other type of error correction by petition (extendable to five (5) months under 37 C.F.R. Section 1.53(c)) including the filing of missing pages of a patent specification or figures to the drawings, where the Applicant is able to obtain the same initial filing date as a submission of a completely deficient patent application?

4. There is a pre-printed form for revival of an abandoned PCT National Phase Patent Application, which is attached as Appendix A. This allows people to obtain a national phase patent application when they do not file the patent application or pay the fee within the requisite time period with a mere statement that the delay was unintentional. It is respectfully believed that the Applicant, who has filed a complete patent application, without delay, and with an appropriate fee authorization should not be prohibited from obtaining a U.S. National phase patent application. If Applicant utilizes this petition to revive, then there will two patent applications with identical subject matter, which is directly prohibited under 35 U.S.C. Sections 121 and 101. Therefore, should an applicant who is completely dilatory in filing a national phase patent application have a superior ability to rectify the situation over an applicant who has filed a complete patent application within the requisite time period with a complete payment authorization?

5.   Should the Applicant, because of his status as a foreign citizen, suffer an undue hardship and prejudice due to the loss of PCT national phase status? The Applicant will be required to provide a certified copy of the Great Britain Patent No. 9914418.0, which is very prejudicial against this foreign individual since a similar requirement is not required for a PCT national phase application since the certified copy of this Great Britain Patent has already been filed. Also, it is not required of U.S. citizens regarding co-pending U.S. patent applications. There is also a separate PCT definition for unity of invention that is also more liberal than that found under United States Regulations so that by proceeding under U.S. Regulations will also pose a severe detrimental hardship to this Foreign Applicant.

ACTION REQUESTED:

Conversion of U.S. Application Patent Serial No. 10/039,565 to a U.S. national phase patent application of International Patent Application No. PCT/GB00/02413 is respectfully requested.

DISCUSSION:

Applicant filed the enclosed the Preliminary Amendment, which is hereby attached as Appendix B, which operates as a substitute specification and under 37 C.F.R. Section 1.125 can be filed at any time in U.S. national phase applications up to the point of issuance. This preliminary amendment is **specifically addressed to Box PCT, United States Designated/ Elected Office (DO/EO/US)**. Box PCT, under Official Gazette Notices dated February 5, 2002 is "**only for** mail related to applications filed under the Patent Cooperation Treaty" as shown in Appendix C. A bypass continuation patent application is not a PCT application but merely a U.S. patent application that claims priority to an International PCT Application. Therefore, since this was not a new international patent application, the only possible patent application that could have been filed based on this preliminary amendment was a PCT national phase patent application. It is respectfully believed that no bypass continuation patent applications have ever been filed at Box PCT, United States Designated/ Elected Office (DO/EO/US). The heading identification material also makes it clear that it is a PCT case that claims priority of a patent application from Great Britain that was filed on June 22, 1999. This was the **only reference to priority**. Under 35 U.S.C. Section 119, as well as the Paris Convention, there is only a **twelve**

(12) month priority period for a foreign patent application. This time period **expired on June 22, 2000.** Therefore, this claim to priority is totally meaningless if this is a bypass continuation patent application. The only way this priority claim makes any sense whatsoever is by referring to the listed International Patent Application No. PCT/GB00/02413 that was filed on June 21, 2000 to ascertain the only real possibility, which is that this is a U.S. national phase patent application. Therefore, it is respectfully believed that a review of the heading identification material on the preliminary amendment that was addressed to Box PCT at the United States Designated/ Elected Office (DO/EO/US) and the claim of priority to a patent application that was filed more than twelve (12) months ago would demonstrate that there is no ambiguity, but only one possible conclusion, which is that this U.S. Patent Application Serial No. 10/039,565 is a U.S. national phase patent application.

      The transmittal document that was utilized, attached as Appendix D, is merely the standard transmittal prescribed by the United States Patent Office that lists the attached documents and includes a fee sheet that allows payment of any additional fees. The use of this transmittal was a mere inadvertent clerical error. The fee sheet provides for payment of any additional fees to fully comport with 35 U.S.C. Section 371, 37 C.F.R. Section 1.494 and 37 C.F.R. Section 1.495. This transmittal document requires, in **Section 18**, that: "**If a CONTINUING APPPLICATION, check appropriate box,** and **supply the requisite** information below and in a preliminary amendment, or in an Application Data Sheet under 37 C.F.R. Section 1.76." (emphasis added). The box for a continuing application was specifically not checked and continuing application data was specifically not provided. This data was deemed **required**, which is defined in *The New Lexicon Webster's Dictionary*, p. 846 (1987), herein attached as Appendix E, as: "stipulated or demanded" "Stipulation" is defined as: "---a condition for reaching agreement." *Id.* at 975, herein attached as Appendix F. Therefore, the absence of this necessary material makes it clear that a bypass continuation was not desired nor wanted. It is respectfully believed that Applicant should not obtain a bypass continuation when the necessary and requisite material mandated by the transmittal was not provided. Therefore, by not providing this material makes it very clear that it was a U.S. national phase patent application that was filed and not a bypass continuation patent application. In addition, the entire Express Mail package **is specifically sent to Box PCT.** It is respectfully believed that when the Applicant sends a document to Box PCT, which is only for international patent applications, this

patent application should not be removed from this area of the United States Patent Office, in direct contradiction to the Applicant's Express Mail Address, and provided a filing status under 35 U.S.C. Section 1.53(b). There is a specific Post Office Box, which is "Box PATENT APPLICATION" for regular U.S. patent applications, such as bypass continuation patent applications, and Applicant specifically did not address this Post Office Box, but only Box PCT on **both** the preliminary amendment and the U.S. Express Mail Envelope. Applicant respectfully believes that it is inappropriate to re-route this patent application to Box PATENT APPLICATION when the Applicant specifically addressed this patent application to go to Box PCT in two specific locations and did not direct the patent application to go anywhere else.

Therefore, both documents either viewed alone or together, on their face, eliminate all possible ambiguity and make it clear that a U.S. National Phase Patent Application was intended and any possible intent to file a bypass continuation application was clearly negated. In other words, no bypass continuation applications are filed at Box PCT/ United States Designated/ Elected Office (DO/EO/US) and the **required** information regarding continuation data was not provided on the transmittal document.

Although the United States Patent Office has a special form for the transmittal of fees and documents for entering the U.S. national phase, the PCT Applicant's Guide – Volume II – Page 7, attached herein as Appendix G, specifically states that this "---form should preferably **(but need not)** be used." (US.03, emphasis added). Therefore, the inadvertent use of the wrong transmittal document should not preclude Applicant from obtaining national phase patent application status.

The United States Patent Office provides correction of virtually every type of error and irregularity. This includes correction of inventorship, correction of a filing date, and so forth. The United States Patent Office even allows for filing of missing pages of a patent application and missing drawings at a later date, while providing the Applicant with the filing date of the few papers that were initially filed. This can be extended up to five months under 37 C.F.R. Section 1.53(c). In the alternative, the correct transmittal form for this patent application is hereby submitted as Appendix H. This is only one pre-printed form and should have much less significance than any page missing from a patent application. Applicant respectfully requests comparable treatment and consistency in U.S. Patent Office practice. The Commissioner is

authorized to charge any additional fees needed to correct this error to the Applicant's Deposit Account No. 11-0160.

In addition, one of the five pre-printed forms that is available for an Applicant from the United States Patent Office for entering the U.S. national phase is a Petition for Revival of an International Application for Patent Designating the U.S. Abandoned Unintentionally under 37 C.F.R. Section 1.137(b), hereby enclosed as Appendix A. This allows an Applicant to have a U.S. national phase patent application even when the time limits are totally ignored and absolutely nothing is filed within the requisite time period. In this case, a full and complete patent application was filed with appropriate payment (fee and fee authorization) within the requisite time period that fully comports with 35 U.S.C. Section 371(c). Therefore, even if the Applicant files a petition of this nature and the petition is granted, then Applicant will have two pending patent applications that are absolutely identical. Under 35 U.S.C. Sections 101 and 121, this is absolutely and totally **prohibited** by the United States Patent Office and the Courts as **double patenting**.

It is respectfully believed that there is no logical reason to allow an applicant, who is absolutely dilatory and does not file anything within the requisite time period set forth by the Patent Cooperation Treaty, to be able file a petition with a statement that the entire delay was unintentional and easily obtain a U.S. national phase patent application but deny an applicant national phase patent application status, who has fully complied with all aspects of 35 U.S.C. Section 371(c) by filing a complete patent application with an appropriate payment (fee and fee authorization) within the requisite time, simply due to the presence of an erroneous transmittal document. It is respectfully believed that this is particularly unreasonable when both the submitted transmittal document and the heading identification material from the preliminary amendment absolutely dictate a national phase patent application and not a bypass continuation patent application. It is respectfully believed that the administration of the laws related to patents by the United States Patent Office is fair and evenhanded. In view of this, since an applicant who is totally dilatory can obtain a U.S. national phase application then an applicant who fully complies with 35 U.S.C. Section 371(c) is most certainly entitled to a national phase patent application especially in view of a clear and unequivocal expression of this intent.

This Applicant is a foreign citizen, so that loss of U.S. national phase status will require a certified copy of the Great Britain Patent No. 9914418.0, which operates as an extreme hardship

and is very prejudicial against this foreign individual since a similar requirement is not required for the U.S. national phase patent application since a copy has already been filed with the PCT International Application PCT/GB00/02413. Also, it is not required of U.S. citizens with regard to co-pending patent applications that were filed in the United States. Moreover, the standard for unity of invention is much more liberal under the PCT Regulations than under U.S. Regulations, which could also provide a hardship for this Foreign Applicant. It is respectfully believed that constitutional issues are raised when similarly situated applicants are treated differently based on their country of origin.

CONCLUSION:

The undersigned respectfully submits that the present application should be corrected to obtain U.S. national phase filing status. Upon review of the preliminary amendment identification heading and the transmittal document, the Applicant clearly and unequivocally expressed his intent to have a U.S. national phase patent application. The preliminary amendment and Express Mail envelope were specifically addressed to Box PCT, United States Designated/Elected Office (DO/EO/US), which only accepts PCT patent applications and not U.S. bypass continuation patent applications. The priority data makes no sense since it would have expired under 35 U.S.C. Section 119 if the application was a bypass continuation application and not a U.S. national phase patent application. Even though a standard transmittal document was utilized, mandated and required continuation information was specifically not provided by the Applicant. Therefore, this transmittal document can only indicate a U.S. national phase patent application since it is the only other option besides the bypass continuation patent application for this preliminary amendment.

In the alternative, the United States Patent Office specifically allows for later submission of major portions of a patent application and still grants the applicant the filing date of the initial submission. In view of this, there is nothing under either 37 C.F.R. Section 1.53(c) or 37 C.F.R. Section 1.182 that precludes one of these omitted pages from being the transmittal document, especially since the transmittal document plays a very trivial role and does not define the scope of the patent protection like the missing pages from a patent specification or missing drawings. The recommended transmittal document, as filed-out for this Patent Application, is attached herein as Appendix H.

Also, since an applicant who completely ignores the filing deadline for a PCT application can file a petition that explains that the delay was unintentional and easily receives a U.S. national phase application should not be in a superior position to an applicant who has fully complied with 35 U.S.C. Section 371 by filing all requisite items within the requisite time period.

Moreover, the loss of U.S. national phase status for this Foreign Applicant will operate as an extreme hardship by requiring a certified copy of a foreign patent application, which the Applicant has already provided as part of the international application process. It is also very prejudicial to this Applicant since similarly situated U.S. Applicants claiming priority from copending U.S. patent applications are not under this same requirement. This also applies to the unity of invention standard, which is more liberal under the Patent Cooperation Treaty than under U.S. law and will operate to this Foreign Applicant's extreme prejudicial detriment.

Therefore, Applicant respectfully requests conversion of this patent application to a U.S. national phase patent application. Please charge the petition fee of $130 as set forth in 37 C.F. R. Section 1.17(h) and any other charges necessitated by this petition to Account No. 11-0160. If a telephone conference would facilitate resolving any issue related to this petition, the undersigned attorney for Applicant would appreciate and welcome such a telephone conference. The attorney for Applicant may be contacted as provided below.

Respectfully submitted,

Dated: <u>February 19, 2002</u>
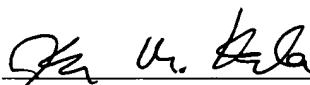
Kevin M. Kercher
Registration No. 33,408
Blackwell Sanders Peper Martin L.L.P.
720 Olive Street, 24th Floor
St. Louis, MO 63101
(314) 345-6249
Attorney for Applicant

APPENDIX

Appendix A   Petition for Revival of an International Application for Patent Designating the U.S. Abandoned Unintentionally under 37 C.F.R. Section 1.137(b)

Appendix B   Preliminary Amendment

Appendix C   Official Gazette Notices dated February 5, 2002

Appendix D   Transmittal Document

Appendix E   P. 846 of *The New Lexicon Webster's Dictionary* (1987)

Appendix F   P.975 of *The New Lexicon Webster's Dictionary* (1987)

Appendix G   Page 7 of PCT Applicant's Guide – Volume II

Appendix H   Correct Transmittal Form for this Patent Application

APPENDIX A

PETITION FOR REVIVAL OF AN INTERNATIONAL APPLICATION FOR PATENT DESIGNATING THE U.S. ABANDONED UNINTENTIONALLY UNDER 37 CFR 1.137(b)	Docket Number (Optional)

First named inventor:

International (PCT) Application No.:

Filed:

Title:

U.S. Application No.:
(if known)

Attention: PCT Legal Staff
Box PCT
Assistant Commissioner for Patents
Washington, D.C. 20231

The above-identified application became abandoned as to the United States because the fees and documents required by 35 U.S.C. 371(c) were not filed prior to the expiration of the time set in 37 CFR 1.494(b) or (c) or 1.495(b) or (c) as applicable). The date of abandonment is the day after the date on which the 35 U.S.C. 371(c) requirements were due. See 37 CFR 1.494(g) or 1.495(h).

APPLICANT HEREBY PETITIONS FOR REVIVAL OF THIS APPLICATION

NOTE: A grantable petition requires the following items:
        (1) Petition fee
        (2) Proper reply
        (3) Terminal disclaimer with disclaimer fee--required for all international applications having an international filing date before June 8, 1995; and
        (4) Statement that the entire delay was unintentional.

1. Petition fee

   ☐ Small entity - fee $_____(37 CFR 1.17(m)). Applicant claims small entity status. See 37 CFR 1.27.

   ☐ Other that small entity - fee $_____(37 CFR 1.17(m))

2. Proper reply

   A. The proper reply (the missing 35 U.S.C. 371(c) requirement(s) in the form of
   _____ (identify type of reply):

   ☐ has been filed previously on _____.
   ☐ is enclosed herewith.

[Page 1 of 2]

PTO/SB/64/PCT (10-00)
Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

3. Terminal disclaimer with disclaimer fee

☐ Since this international application has an international filing date on or after June 8, 1995, no terminal disclaimer is required.

☐ A terminal disclaimer (and disclaimer fee (37 CFR 1.20(d)) of $_____for a small entity or $_____for other than a small entity) disclaiming the required period of time is enclosed herewith (see PTO/SB/63).

4. Statement. The entire delay in filing the required reply from the due date for the required reply until the filing of a grantable petition under 37 CFR 1.137(b) was unintentional.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

_____
Date

_____
Signature

Telephone
Number: (___)_____

_____
Typed or printed name

_____
Address

_____

Enclosures: ☐ Response
☐ Fee Payment
☐ Terminal Disclaimer Form
☐ _____

APPENDIX B

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Stringer, Andrew Mark :

Application No.: Unknown   :

Filed: Herewith   :

PCT No.: PCT/GB00/02413   :

International Filing Date: 21 June 2000   :

Priority Data: 22 June 1999   :

                    :

Examiner: Unknown

Group Art Unit: Unknown

Attorney Docket No.: 717901.20

Customer No.: 27,128

Confirmation No.: Unknown

For: COMPUTER NETWORK PAYMENT SYSTEM

Box PCT
United States Designated/Elected Office (DO/EO/US)
P. O. Box 2327
Arlington, VA 22202

PRELIMINARY AMENDMENT

Sir:

Prior to examination, it is respectfully requested that the application be amended as follows:

Please delete the entire specification.

Please replace with the following substitute Specification in compliance with 37 C.F.R. Section 1.125(b):

COMPUTER NETWORK PAYMENT SYSTEM

TECHNICAL FIELD

The invention relates to a system and method for transferring payments corresponding to the supply of information over a computer network. In particular the invention relates to a system and method for transmitting payment information between servers and clients by means of a hardware infrastructure of linked routers and by means of a specially adapted protocol. The protocol used by the system and method of the invention is referred to herein as "Packet Tariff Protocol" or "PTP". It is to be understood that the term PTP when used in the following description should be taken to mean a protocol adapted for use with systems which transfer data in packets between servers and clients, the protocol enabling the transmittal of payment information between the servers and clients.

It is also be to understood that the term "packet" when used in the following description should be taken to be a generic term, meaning any discrete package or block of data that is described by any particular protocol, as appropriate to any particular communication layer. For the purposes of the following description the term "packet" should therefore include message, segment, datagram, frame and any other term which by definition or common usage is accepted as meaning a discrete package or block of data in the context of a specific protocol, as appropriate to any particular communication layer.

BACKGROUND OF THE INVENTION

Access to the Internet is freely available everywhere and the advent of e-commerce, or electronic trading, is set to revolutionize the way that business is done. However there remains a requirement for effective trading of information itself. As the infrastructure and available bandwidth expand to appropriate levels, the world will become a single, on-line, global, multimedia library. All public domain information will be available to anyone with a network connection, via a simple, easy to use interface, analogous to today's Web browser application. In addition, suitable tools will be developed to manage the information and tailor all that is

available to suit the particular needs of each individual. There are two major consequences of this, as follows.

Firstly, holding information locally will become redundant. This means that books, CDs, prerecorded videotapes and so on will eventually not be required. When information is sufficiently cheap and reaches the necessary levels of specificity and availability, there will be no point in individuals holding local copies of the information, in the form of books, CDs, tapes etc., that will quickly go out of date. They will simply access the latest, updated information from its original source or retrieve other data (noting that any digital multimedia information is fundamentally just data) from on-line archives.

Secondly, broadcast media will also become redundant. Radio stations, TV channels, newspapers and journals will no longer serve any purpose. Once again, highly sophisticated information management tools will retrieve information from the massive range of disparate original sources that will come into existence, with the output collated, rationalized and customized to match the particular requirements of each networked individual.

These changes lie in the future, but are inevitable, and are likely to result in commercial upheaval and colossal social changes. At present, however, there remains a pressing need for a consistent and appropriate system or method to permit the implementation of this trade in information. The system must conform to, and operate under, the conditions that exist within free-market commercial and national economies. It is the development of a proposed solution to this problem, which is addressed by the present invention.

SUMMARY OF THE INVENTION

The PTP or "Packet Tariff Protocol" is an element within an effective system for digital networks at packet level. The protocol is envisaged as, but not limited to, an evolution of the existing TCP/IP (Transmission Control Protocol/Internet Protocol) standard that forms the core of the Internet as it presently exists. However PTP is not limited to TCP/IP applications, but can be used in any environment where there is transfer of data in distinct pieces or packets, for

example WAP (Wireless Application Protocol), UMTS (Universal Mobile Telecommunications System), GPRS (General Packet Radio Service) or others.

According to a first aspect of the present invention there is provided a method of electronic payment for data transferred across a computer network containing at least one client, at least one server and at least one router which forwards data, the method comprising the steps of:

sending an electronic data request from a client to a server via one or more routers; and

sending electronic data from the server to the client via one or more routers in response to the electronic data request, the electronic data having associated with it a data field containing a value which represents the commercial value of the data contained within the electronic data.

Preferably the electronic data is transmitted in the form of packets. Preferably each of the one or more routers receives an incoming data packet, reads the value in the data field associated with the incoming data packet, calculates a new value based on the read value and the cost of forwarding the data packet, and forwards the data packet with the new value in the associated data field.

Preferably each of the one or more routers checks whether the value in the data field associated with the incoming data packet falls within predefined parameters and rejects the packet if the value falls outside the predefined parameters. The parameters may depend on the source of the data packet or the originator of the data request.

The electronic data request may also have associated with it a data field containing a value, which represents the commercial value of the data contained within the electronic data request.

Preferably total accumulated values for transactions between routers or between routers and servers/clients are recorded. These total values may be used as the basis for payments between the operators and/or users of the routers, servers or clients. Periodic clearance payments may be made between the operators and/or users of the routers, servers or clients, the clearance payments corresponding to the total accumulated values.

According to a second aspect of the present invention there is provided a system of electronic payment for data based on a hardware infrastructure of linked routers, data providers and data users, comprising:

at least one client;

at least one server for providing electronic data in the form of data packets in response to a request from a client and having its operation governed by a server protocol which causes each data packet sent by the server to have associated with it a data field representing the value of the data contained within the packet;

at least one router linked by a hardware infrastructure to the server and the client and having its operation governed by a routing table and a router protocol; and

whereby the router protocol causes each router to add commercial value to the packet by forwarding it in accordance with the routing table and to update the value contained in the data field within the packet to reflect this added commercial value.

Preferably the router protocol also includes procedures for rejecting individual packets in accordance with pre-defined parameters related to the value of each packet on receipt.

According to a third aspect of the invention there is provided a method of electronic payment for data transferred across a computer network containing at least one client, at least one server and at least one part of the network which forwards data, the method comprising the steps of:

sending an electronic data request from a client to a server via the part of the network; and

sending electronic data from the server to the client via the part of the network in response to the electronic data request, the electronic data having associated with it a data field containing a value which represents the commercial value of the data contained within the electronic data.

Preferably the electronic data is transmitted in the form of packets. Preferably the part of the network has an associated data processor which reads the value in the data field associated with an incoming data packet received by the part of the network, calculates a new value based

on the read value and the cost of forwarding the data packet, and forwards the data packet with the new value in the associated data field.

The data processor may check whether the value in the data field associated with the incoming data packet falls within predefined parameters and rejects the packet if the value falls outside the predefined parameters.

According to a fourth aspect of the invention there is provided a method of electronic payment for requested data transferred across a computer network containing at least one client, at least one server and at least one router which forwards data, in which the requested data is sent from the server to the client in the form of a packet,

wherein the packet comprises a packet header and packet data,

the packet data containing the requested data, and

the packet header containing one or more address fields containing address information relating to the client and/or server and a data field containing a value which represents the commercial value of the requested data contained within the packet data.

Preferably the data is sent via the router which reads the value in the data field of the incoming data packet received by the router, calculates a new value based on the read value and the cost of forwarding the data packet, writes the new value to the data field, and forwards the data packet with the new value in the data field.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described, by way of example only, with reference to the accompanying figures, where:

Fig. 1 is a schematic representation of a typical generic form of a digital data packet under the system of the invention;

Fig. 2 is a schematic representation of a fragment of a network; and

Fig. 3 is a flow chart showing the operation of a network router under the system according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

The invention can best be understood by considering the metaphor of the supply chain with associated added value at each stage. In other words, at each step in the process to supply the information, value is added over and above the intrinsic value of the information. Therefore, an additional cost is associated with the information at each stage, until it reaches its ultimate destination. In practice, this is achieved by the incorporation of a "value" field into each data packet, allied with network protocol extensions to implement and utilize this field in the packet. This is applied in a way that ultimately results in the cost of providing the intrinsic information and the cost of providing the transport service being enumerated and accrued in the value field. These costs are thus accounted for within the same system that actually provides the data transport service, so that the supply chain and the value chain are both incorporated into the network protocols.

The value field may be augmented with a "priority" field, along the lines that have already been proposed by other bodies as part of existing technical specifications. Within this framework though, the priority field can additionally be used as part of the commercial system if required, so that different services can incur different costs although they may share the same hardware and network infrastructure. In some prior art developments, the "priority" field of a data packet has evolved to serve a more advanced purpose, and the field contains a code that indicates how data should be handled, according to its characteristics. For example, transmission of data that is part of a video stream might not be re-tried if it fails first time, since a degraded video output is considered to be more useful to the ultimate end-user than a pause to wait for all the information to achieve perfect reproduction. In contrast, a file transfer can usually wait for the availability of network capacity, but must ultimately be one hundred percent complete, accurate and checked if it is to be of practical use.

In the system according to the invention, data is transferred between servers and clients in packets. Fig. 1 shows the typical generic form of a digital data packet under the implementation of PTP.

The packet 10 is simply data in a mutually understood format. In the example of Fig. 1, it is divided into three sections 1, 2, and 3. Each section may be further divided into multiple fields, as described below. The packet header 1 contains general fields 4 for addressing information or other information and also contains a value field 5. The number of general fields 4 depends on the protocol used, and it is to be understood that the number of general fields 4 and the position of the value field 5 within the packet header 1 may vary. The packet data 2 contains the data 8 and follows the packet header 1. The packet tail 3 follows the packet data 2 and is optional, but would typically contain a field 6 containing the checksum for the packet, or similar error detection information, and may contain other general fields 7. Again it is to be understood that the number of general fields 7 and the position of the checksum field 6 within the packet tail 3 may vary. It is to be understood that the value field may be in any position within the packet, for example within the payload or packet data 2, or within the packet tail 3.

Each data packet 10 includes a value field 5, which contains information about the intrinsic value of the data 8 contained within the packet, and which accumulates the charges made for each step in the provision of the service for supplying that data packet to its ultimate recipient. As an example, this aggregated overall worth may be measured in Network Credit Units (NCU's).

For the purpose of applying tariffs, the network system is considered to consist of "servers", "routers" and "clients" although in practice a single machine or even a single software application may fulfill more than one of these functions at different times. For example, a router can be considered to be acting as a client to many servers and as a server to many clients, as defined by the routing tables to which it adheres at any particular moment in time.

Fig. 2 is a diagram showing a network fragment. Under the system of the invention it may operate in the following manner. The web client 20 operated by the ultimate end user requests information in the form of a message that passes through router (N) 22 at the internet service provider (ISP) connection and accrues added value as a result of the action of the transport service. The message subsequently passes through a number of intermediate routers (not shown) and finally through router (A) 24 and accrues more added value for the extra

transport service. The intermediate routers and routers (A) and (N) form the network infrastructure carrying the data. The message then arrives at the web server 26, which responds by initiating a data stream. The web server 26 is operated by a content provider. The packets of this data stream typically have intrinsic value, associated with the information that they contain, the information being provided or sold by the content provider. The appropriate component of this intrinsic value is recorded in each packet. The packets then pass back via router (A) 24 and have the associated value of the transport service added to them. Similarly, router (N) 22 passes the data stream and adds further value to the packets for the service provided. The information finally arrives at the web client 20, as required.

For each machine on the network, the net values of packets received and transmitted via each hardware connection can then be calculated. These values are reconciled by the owners of all the machines involved, as the basis for assessing the economic value of the services provided and calculating the commensurate hard currency exchanges required. This process is described in more detail below.

In accordance with the PTP idea, the web client 20, or any software application functioning as a client, maintains the right to reject individual packets if they are deemed "too expensive" by some criteria, without assuming their associated notional cost. Additional control is maintained by monitoring the value of incoming packets in real time, typically by summing the total value arriving in the last second and/or minute and/or hour and/or other time interval, as required. This might, for example, be depicted by a meter representation or bar indicator on a network terminal screen. Over a short time period, of the order of a few seconds or so, it might be acceptable to have a large amount of data arriving with a large value at a high rate of value accrual, for example when downloading a software application. However over a longer time period, of the order of an hour or so, a high rate of value accrual might be unacceptable while it might be acceptable to have a continuous stream of data arriving with a smaller value, for example when downloading a movie or video in real time. A meter representation could also apply to an Internet telephone, and the system could show the cost of a call as it takes place, rather than the owner subscribing to the service on a predetermined tariff scheme. This does not

preclude a service provider agreeing to absorb the fluctuations in cost and passing on packets at agreed rates if such a service is desired by clients on the network. This might be appropriate, for example, if a client actually desired predetermined costs for use of the system, e.g., for budgeting purposes.

The invention is now described in more detail. For the purposes of the description herein, a packet originates from a server that acts as a "content provider", i.e., it is the source of the data or information contained within the packet that is to be transferred. This piece of information and the service of providing it both have some inherent worth and this worth can be enumerated and written in the value field of the packet. This is the first element of the system of the present invention, in that content providers can attach a value to the information that they provide and, further, they can assert the claim to that value along the same delivery channel as that by which the information itself is supplied. On receipt of the packet, the client (or router acting as a client) can accept the packet or reject it. The control system, which makes the decision and determines the outcome of this choice is described later. It is of importance, because information cannot meaningfully be returned once received.

Assuming that a router receives and accepts a packet, it then acts in its role as a server and forwards it in accordance with the routing tables it currently holds. It should be noted that this always entails sending the packet down a physical data connection of some sort. The network is defined by the routing tables, but always has a physical existence as data conduits between machines. In the system of the invention, the routing machine defines the worth associated with the action of passing a packet from one machine to the next. It might be a fixed rate, or it might be dependent on the priority of the packet or on some other parameters (e.g., network loading, time of day, physical distance between machines, available bandwidth, ownership of network infrastructure, etc.). The important point is that this evaluation can be resolved by the router (probably as part of its routing software) as it passes the packet and that the outcome of this calculation is added to the value field of the packet in transition (i.e., before it is forwarded). This is the second element of the system of the present invention, in that network infrastructure providers can attach a value to the service of transporting information and,

further, they can assert the claim to that value along the same delivery channel as that by which the information itself is supplied. It is also necessary for each machine to accumulate the total number of NCU's it receives from each physical connection and the total number of NCU's it dispatches to each physical connection, excluding those attributed to packets that are subsequently rejected. It should also be noted that physical connections for the receipt of packets are considered to be distinct from physical connections for the dispatch of packets, even though they might be manifested in the same piece of cabling.

Under these conditions, the number of NCU's transmitted from the machine at one end of a physical connection should agree with the number of NCU's accepted by the machine at the other end. These machines may be owned by different organizations but, on the basis that they agreed to make the trades, they should be reasonably expected to have mutual interest in ensuring accuracy in accounting. A commercial analogy for this would be a deal done on an "open outcry" trading floor, in which two parties agree a deal by signals and each makes a record of it independently. The independent records are reconciled at a later stage but, since both parties agreed the initial deal, both are assumed to have an interest in making sure that it is recorded accurately. The analogy goes further, since any party that establishes a reputation for not recording deals accurately will simply find it impossible to establish or maintain any profitable trades.

Within this protocol, any recipient reserves the right to reject any packet. This rejection includes refusal to accept the debt associated with receipt of the packet. The most probable reason for this is that the packet is deemed by some criteria to be "too expensive". This act of rejection is an important part of the protocol and therefore warrants detailed discussion. As discussed above, once data is received it cannot be meaningfully returned, since it is not a physical object. On first inspection, then, it seems that there would be a propensity to defraud suppliers by rejecting packets (and therefore the liability to pay for them) whilst still forwarding the data and charging for it. However, the post-receipt rejection process is vital to remove completely the possibility that single "rogue" packets of massive value are foisted on unsuspecting recipients. The reason that an immediate breakdown of the system according to the

invention does not follow is because successful trading requires streams of many packets of modest value to be passed through the network. In the proposed scenario, the "catch 'em once" price-value combination is excluded by this ability to refuse to pay for excessively costly packets. This means that a sustainable and profitable trade will only occur with the transmission of an ongoing packet stream.

This "reject" aspect of the system according to the invention may best be understood by considering a "sale or return" analogy. A producer (content provider) creates a product (data/information) and delivers it to a reseller (router) at some cost (the value in NCU's). The reseller (router) either accepts it, on the basis that it can be sold on (forwarded to another router or an end client) at a marked up price (an addition to the value in NCU's) or, alternatively, rejects it. The producer (content provider) monitors the rejections of the reseller (router) and decides on the basis of this information whether or not to continue trading and, if so, what price structure to apply. Hence, the choice of acceptance or rejection of a packet is effectively a "sale or return" of the data, since keeping occasional packets without paying for them is of little economic value. In practice, it will rapidly become the case that meaningful trade in packet streams allied to competitive pricing is the only way to maintain profitable transactions.

Termination criteria are based upon single packet costs and the cost accumulations of packets over selected time intervals. Hence termination requests are issued if any single packet exceeds the NCU threshold or if the limits for NCU's per second, minute, hour, day and/or other time interval are exceeded. The cut-off levels are best kept confidential to avoid prices being bumped up to the maximum that would be accepted, although such information could be shared with trusted counterparts in an attempt to reject packets deemed too costly at an earlier stage. Note that single-packet rejection is the only rejection where packets are not paid for, other termination is simply a request to cease supplying data. Data received before supply terminates are still paid for, subject to single packet criteria.

Conversely, the value attributed to data by content providers could be freely advertised. This would make competition between content providers more effective and would also highlight expensive transport routes, since the value of the packet received would have had risen

unacceptably when compared to the initial value advertised by the content provider. Furthermore, data network routing should become an extremely efficient market because data transmission networks can be reconfigured so easily and pricing structures changed so readily. This should result in perfect competition, evolving to satisfy the laws of supply and demand in a free market.

The final element of the system according to the invention is achieved by converting the residual difference in NCU's exchanged between a pair of machines over some physical connection into a payment in mutually acceptable hard currency. This can always be achieved bilaterally, but could also be administered by some kind of clearing house with responsibility for a defined physical region of the network. There is a potential problem here, unless the exchange value of an NCU is pegged to some hard currency. Otherwise, it will float erratically as the number of NCU's per network transaction can vary inversely with the exchange rate to hard currency, without changing the actual monetary worth of the network transaction. The problem might however eventually resolve itself if the NCU becomes a stable, global currency in its own right.

To complete a transaction using this system, an ultimate client could first issue a request for some information. For the purpose of this example only, it will be assumed that this request is contained in a single packet. The intrinsic value of this packet would probably be zero but, in all cases, could not exceed a predetermined maximum accepted by the router (which may well be the machine of a network service provider, acting at this point as a client). Further, since this machine is probably not owned by the owner of the ultimate client machine, there would be no tariff added to the value of the packet. The router, now acting as a server, adds a tariff to the packet and passes it to the next router. This process is repeated across the network until the packet reaches the machine of the content provider that, somewhat confusingly, is at this point acting as a client. Hence, the content provider receives a request for information but becomes liable for the accrued value of the packet. This value will be relatively small, since it is only one packet (or, more generally in practice, a relatively small number of packets) and it has little or no intrinsic value in its information content. It can be thought of as analogous to the cost associated

with a free-phone telephone number that businesses commonly use to attract enquiries from customers.

The machine of the content provider now acts in its primary role as a server, and starts to send packets addressed to the machine of the ultimate client (i.e., the machine from which the original request for data originated). Since the packets have content that is deemed to have some worth, these packets now have a significant value associated with them even as they are dispatched from the server machine. As they traverse the network, they will accrue further value until they reach the ultimate client machine. Routers within the network will have added value to packets passing both ways, so that owners of these machines will be in residual credit after paying for the packets received and will therefore be able to reclaim hard currency converted from NCU's to finance their activities. The content providers will have some liabilities for the receipt of the packets requesting data but will have a large residual credit for supplying the information. The ultimate client will contribute the majority of the payments due, which cover the cost of the information they receive and the cost of the process of transporting it to them.

The way in which a network router might implement the PTP, in addition to its existing transport protocol, for the purposes of transferring data packets and accumulating the associated tariffs, is illustrated in the flow chart of Fig. 3. The branches in the flow chart show possible contingencies at various stages, if the required conditions are not satisfied.

The router receives 30 a data packet and checks 32 whether the packet is acceptable under the existing transport protocol. The router also checks 32 whether the routing tables with which it is provided can resolve the address to yield the hardware connection along which the packet is to be dispatched. If the packet is acceptable and the address can be resolved the router proceeds to step 36. If the packet is not acceptable or the address cannot be resolved the router rejects 34 the packet.

The router then checks 36 that the value of the packet as determined from the value field 5 is below the value limit acceptable from the incoming hardware connection. If the value of the packet is not below the value limit the router rejects 38 the packet under the PTP rules. If the value of the packet is below the value limit the router proceeds to the next step, in which the

recorded total value received from this hardware connection is incremented 40 by the value of the packet. The recorded total value received is stored by the router.

The router then calculates 42 the value to be added for the service of transmitting this packet along the particular hardware connection designated by the routing tables. This might depend upon the infrastructure of the hardware connection, the prevailing network loading, the time of day and many other factors. The router then increments 44 the packet's value field 5, which is the packet's internal record of its own value by this calculated value.

The router then transmits 46 the packet along the hardware connection along which the packet is to be dispatched. Following transmittal the router checks 48 that the recipient machine has acknowledged successful transfer of the packet (assuming the transfer protocol supports this). If the transfer is not successful, then this is handled under the existing transport protocol 50. If the transfer is successful the router increments 52 the recorded total value transmitted to this hardware connection by the value of the packet. The recorded total value transmitted is stored by the router.

For each router or hardware connection, the total value transmitted minus the total value received (e.g., in Network Credit Units) is the net profit (or loss) that must be reconciled with the owner of the machine at the other end of that hardware connection. This is used to determine the economic value of the accumulated transactions and forms the basis of the hard currency exchanges necessary to finance the activities and the provision of the infrastructure.

Physical network connections can be created and re-arranged relatively easily and network service providers can normally be changed at will. It is therefore anticipated that the kind of business system envisaged by the present invention will lead to a very efficient market constituted of very many providers of connections and routing bandwidth who serve, collectively, a very large number of content providers and information consumers. For example, if the financial arrangements were controlled in this manner, it might reasonably be envisaged that the infrastructure would evolve to support video on demand. This would be based upon an enormous supply of material, effectively a distributed archive of all the material ever produced. It would satisfy the market by the laws of supply and demand.

One of the major problems associated with any data distribution, and particularly digital data, is that of unauthorized redistribution. Matters of privacy and security are also general problems in the context of the Internet. For the purposes of the description of the invention, it is necessary only to consider whether the use of PTP implies any changes as compared to the situation at present. The system of the invention does not require transfer of data in ways other than those presently possible, and the proposed protocol of the invention would not inhibit any of the security or encryption methods used to prevent such unauthorized redistribution. In fact, security and encryption would be expected to take place at the level of the data within the packet stream, rather than acting at the packet level itself.

One important feature of the system of the invention is that it allows consumers to choose exactly what they require without having to pay for unwanted accompanying material. For example, they can select one track without having to pay for a complete music CD, or they can decide not to view the remainder of a film if they dislike the opening portion. Also, the purchase price should be subject to very keen competition. These facts in themselves mean that there is less temptation to acquire material from illegal sources. Any legal deterrents become more effective if individuals can buy selectively only what they actually require, and at a fair price.

In addition, as individuals are presented with, and begin to utilize, the much greater choice of available information, their interests will rapidly diversify and their requirements will diverge. This will have the effect of making it more difficult to cache data as it passes through the network and resell it multiple times. If content becomes sufficiently cheap, it will not be worth the investment in hardware to cache it. There will be less demand for any particular content, so that the logistics of illegal storage for reselling become more expensive and therefore less attractive. This is not to say that a legal business of caching and reselling popular information could not build up, still within this framework. This could, for example, be how what are now broadcast services continue to make money. Network capacity will need a large step-change before commonly required content can be served to all clients from a single source, a matter which is presently addressed by the use of network caches, proxy servers and mirror sites on the Web. Such issues are tied in with copyright and ownership of content. For example,

it is not generally possible for an end-user to tell whether content comes from its original provider or from some legitimate or illegitimate cache. Once again, the implementation of the system of the invention would not impact upon these matters of copyright and ownership of content.

The system of the invention as described above can also function with the concept of the network computer, which for example means that a user might have the option of purchasing the use of a software application for some period rather than actually buying the application outright. Once again, they receive (and pay for) only what they actually require, and always get the most up to date version so that rapid obsolescence is not a concern.

One other important feature of the PTP concept is that it can be interfaced with a conventional network, operating under a different business model, provided charging rates and so forth are agreed for the interfaces. This means that network fragments can be created or converted to conform to the PTP model as and when suits the infrastructure owner, so that gradual conversion is possible and a massive "roll-out" program is unnecessary.

It is possible that, for effective operation, the system of the invention will require international financing deals and clearing arrangements, as well as software controlled real-time network configuration changes and real-time pricing structure changes. However, the system of the invention offers two significant advantages, as follows. Firstly, the ultimate client always has transparent data on what the service being received is actually costing, over any desired time interval. This is regardless of the choice of information source, network service or demand driven costing changes. Secondly, PTP represent a good approximation to a perfectly competitive and efficient market, and one in which the costs and revenues are intimately related at all stages to the actual activities from which they result. These features should be expected to encourage serious investment into infrastructure development.

Particular details of a method of implementing PTP in a TCP/IP environment will now be described. In particular, for the value quantity to be directly accessible for processing by the routers, the value field must be contained in the IP Layer header. This is because the TCP Layer header is considered purely as data by the routers that implement IP protocols and, as such, it is

STLD01-906653-1   17

to be transported without any reference to its contents. However, for the value field to be useful to individual client and server applications for the purpose of enumerating the intrinsic worth of the data being transported, it must be accessible to these applications. The applications operate at the Application Layer of the TCP/IP stack and this layer interfaces with the TCP Layer, with the IP Layer being effectively invisible to the application. The matter is further complicated by the existence of UDP (User Datagram Protocol), which provides an alternative protocol at the Transport Layer (and there might be additional alternatives, which either currently exist or will be defined in the future). The invention proposes three solutions to this, as follows.

The first solution is to have separate value fields. According to this solution there are two distinct value fields, one in the IP Layer, to accrue measurement of the economic worth of performing the data transport operation, and one in the Transport Layer, to enumerate the intrinsic worth of the data. Such a solution does not allow the unification of the methods covering the two contributions to the economic model, and so is not the preferred solution.

The second solution is direct communication between the application and the IP Layer. Such communication can be hazardous with respect to the structure and implementation of the TCP/IP protocol and is not generally considered to be a realistic solution. There is a useful exception in the case of an "information server", a system dedicated to serving information on behalf of a content provider and which is accessed by a client dedicated to the task of receiving that information. A server in such a system can run customized application software, in which the direct access to the IP Layer is available as required. The client works solely with the incoming information, so that the resources consumed (and measured in accordance with PTP) on behalf of the client application are indistinguishable from the total resources consumed by the client machine. This is the maximum level of detail that could be measured if the PTP values were accessed directly from the IP Layer, since IP does not work with reference to specific ports or the individual applications which are notionally attached to them.

The third, most favored solution is integration with the Transport Layer. The PTP value field is incorporated in the IP Layer header. The Transport Layer protocol (TCP, UDP or other) is aware of the value field and can convey the information to and from the Application Layer as

required, even though this information is not written in the Transport Layer header and thus not considered to be conveyed at the Transport Layer level. The act of reading and writing the value field would still be expected to be the preserve of the IP Layer implementation software. This structuring appears to be analogous to the way in which applications can have access to IP addresses, although these are actually written in to, and read back from, the IP headers.

Practical details in implementing the router functionality required by the PTP system will now be described. Incrementing the value field does not impose an unacceptable processing overhead on the router. There is a precedent for this kind of processing in the way that the IP standard defines and utilizes a time-to-live (TTL) value in the IP header. This is subject to a decrement each time a router hop occurs. This capability can be extended to include a simple addition to the value field at the same point in the processing. This operation is likely to be an integer addition or binary add function on a specific bit field in the packet header, a relatively straightforward procedure. At the same time developments in hardware technology will go some way to compensating for the increased burden placed upon the network infrastructure by the implementation of PTP. Dedicated hardware may be used to support the value field modification. Since there is an intimate relationship between the physical network connections and the particular value of the increment to be applied, an appropriate piece of equipment can be placed "in line" on each physical network connection, to perform the task. Such a unit can respond to its own communications protocol (something akin to the way routers work with ICMP (Internet Control Message Protocol), ARP (Address Resolution Protocol) and RARP (Reverse Address Resolution Protocol)) to receive updates to the algorithm for the value to be added to passing packets and also to return accumulated totals at appropriate times. Otherwise it operates as a standalone piece of network infrastructure, logging and incrementing the values of passing packets. Such a configuration alleviates the need for routers to allocate the accumulating values to particular network connections or IP addresses in real time, as they process the packets.

In addition, it is also possible that, rather than each and every router performing its own increment to the value field, a more "coarse grained" implementation of the PTP model could be applied. This would occur if the provider of a particular piece of infrastructure were willing to

consider that piece of infrastructure (e.g., an optical fiber "backbone") as a zone and therefore apply a more straightforward tariff for transportation across the zone. This would mean that the logging and increasing of the value fields of packets transported across the zone would only need to take place at the zone boundaries. This scheme is effectively equivalent to considering the flow chart of Fig. 3 to apply to a network zone rather than an individual router.

These and other modifications and improvements can be incorporated without departing from the scope of the invention.

CLAIMS

1. A method of electronic payment for data transferred across a computer network containing at least one client, at least one server and at least one router which forwards data, the method comprising the steps of:

   sending an electronic data request from a client to a server via one or more routers; and

   sending electronic data from said server to said client via one or more routers in response to said electronic data request, said electronic data having associated with it a data field containing a value which represents a commercial value of the electronic data.

2. The method according to Claim 1, in which the electronic data is transmitted in the form of packets.

3. The method according to Claim 2, wherein each of said one or more routers receives an incoming data packet, containing electronic data and a data field associated with the electronic data in the incoming data packet, reads the value in the data field, calculates a new value based on the read value and the cost of forwarding the data packet, and forwards the data packet with the new value in the associated data field.

4. The method according to Claim 3, wherein each of said one or more routers checks whether the value in the data field associated with the electronic data in the incoming data packet falls within predefined parameters and rejects the packet if the value falls outside the predefined parameters.

5. The method according to Claim 1, wherein the electronic data request has associated with it a data field containing a value, which represents the commercial value of the data contained within the electronic data request.

6. The method according to Claim 1, wherein total accumulated values for transactions between routers or between routers and servers/clients are recorded.

7. The method according to Claim 6, wherein clearance payments are made between the operators and/or users of the routers and servers/clients, the clearance payments corresponding to the total accumulated values.

8. A system of electronic payment for data based on a hardware infrastructure of linked routers, data providers and data users, comprising:

at least one client;

at least one server for providing electronic data in the form of data packets in response to a request from a client and having the at least one server's operation governed by a server protocol which causes each data packet sent by the server to have associated with it a data field representing the value of the data contained within the packet;

at least one router linked by a hardware infrastructure to said server and said client and having its operation governed by a routing table and a router protocol; and

whereby the router protocol causes each router to add commercial value to the packet by forwarding it in accordance with the routing table and to update the value contained in the data field within the packet to reflect this added commercial value.

9. The system according to Claim 8, wherein the router protocol also includes procedures for rejecting individual packets in accordance with pre-defined parameters related to the value of each packet on receipt.

10. A method of electronic payment for data transferred across a computer network containing at least one client, at least one server and at least one part of the network, which forwards data, the method comprising the steps of:

sending an electronic data request from a client to a server via the part of the network; and

sending electronic data from said server to said client via the part of the network in response to said electronic data request, said electronic data having associated with it a data field containing a value which represents the commercial value of the data contained within the electronic data.

11. The method according to Claim 10, in which the electronic data is transmitted in the form of packets.

12. The method according to Claim 11, wherein the part of the network has an associated data processor which reads the value in the data field associated with an incoming data packet received by the part of the network, calculates a new value based on the read value and the cost of forwarding the data packet, and forwards the data packet with the new value in the associated data field.

13. The method according to Claim 12, wherein the data processor checks whether the value in the data field associated with the incoming data packet falls within predefined parameters and rejects the packet if the value falls outside the predefined parameters.

14. A method of electronic payment for requested data transferred across a computer network containing at least one client, at least one server and at least one router which forwards data, in which the requested data is sent from said server to said client in the form of a packet,

wherein said packet comprises a packet header and packet data,

the packet data containing the requested data, and

the packet header containing one or more address fields containing address information relating to the client and/or server and a data field containing a value which represents the commercial value of the requested data contained within the packet data.

15. The method according to Claim 14, wherein the data is sent via the router which reads the value in the data field of the incoming data packet received by the router, calculates a new value based on the read value and the cost of forwarding the data packet, writes the new value to the data field, and forwards the data packet with the new value in the data field.

ABSTRACT OF THE DISCLOSURE

A method of electronic payment for data transferred across a computer network from a server to a client by means of at least one router which forwards data. An electronic data request is sent from the client to the server via one or more routers. The server then sends electronic data to the client via one or more routers in response to said electronic data request. The electronic data is sent via a packet transfer protocol, in which each packet of data has associated with it a data field containing a value, which represents the commercial value of the requested data. Each router receives an incoming data packet, reads the value in the data field associated with the incoming data packet, calculates a new value based on the read value and the cost of forwarding the data packet, and forwards the data packet with the new value in the associated data field. Each router can check whether the value in the data field associated with the incoming data packet falls within predefined parameters and rejects the packet if the value falls outside the predefined parameters, for example if the value of the data is too high. Each router stores the accumulated value of received and forwarded data, so that payments may be made to the operator of the router.

REMARKS

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "VERSION WITH MARKINGS TO SHOW CHANGES MADE".

Applicant has amended the specification and abstract to comport with United States Patent and Trademark Office Rules. In addition, Applicant has amended the claims to eliminate multiple dependency and to comport with U.S. practice, which is totally unrelated to patentability. No new matter is added.

In view of the above, it is respectfully believed that all the presently submitted claims are allowable and a Formal Notice of Allowance is courteously solicited. It is believed that the application is in condition for allowance, however, if the Examiner feels otherwise, a telephone interview is respectfully requested. An early notice of allowance is solicited.

Respectfully submitted,

Date: _December 21, 2001_
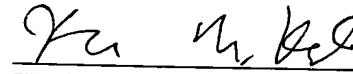
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Following is a marked-up version of the Specification with all changes shown by conventional comparison (underlining and bracketing):

[Computer Network Payment System]

COMPUTER NETWORK PAYMENT SYSTEM

TECHNICAL FIELD

The invention relates to a system and method for transferring payments corresponding to the supply of information over a computer network. In particular the invention relates to a system and method for transmitting payment information between servers and clients by means of a hardware infrastructure of linked routers and by means of a specially adapted protocol. The protocol used by the system and method of the invention is referred to herein as "Packet Tariff Protocol" or "PTP". It is to be understood that the term PTP when used in the following description should be taken to mean a protocol adapted for use with systems which transfer data in packets between servers and clients, the protocol enabling the transmittal of payment information between the servers and clients.

It is also be to understood that the term "packet" when used in the following description should be taken to be a generic term, meaning any discrete package or block of data that is described by any particular protocol, as appropriate to any particular communication layer. For the purposes of the following description the term "packet" should therefore include message, segment, datagram, frame and any other term which by definition or common usage is accepted as meaning a discrete package or block of data in the context of a specific protocol, as appropriate to any particular communication layer.

BACKGROUND OF THE INVENTION

Access to the Internet is freely available everywhere and the advent of e-commerce, or electronic trading, is set to revolutionize the way that business is done. However there remains a requirement for effective trading of information itself. As the infrastructure and available bandwidth expand to appropriate levels, the world will become a single, on-line, global, multimedia library. All public domain information will be available to anyone with a network connection, via a simple, easy to use interface, analogous to today's Web browser application. In

addition, suitable tools will be developed to manage the information and tailor all that is available to suit the particular needs of each individual. There are two major consequences of this, as follows.

Firstly, holding information locally will become redundant. This means that books, CDs, prerecorded videotapes and so on will eventually not be required. When information is sufficiently cheap and reaches the necessary levels of specificity and availability, there will be no point in individuals holding local copies of the information, in the form of books, CDs, tapes etc., that will quickly go out of date. They will simply access the latest, updated information from its original source or retrieve other data (noting that any digital multimedia information is fundamentally just data) from on-line archives.

Secondly, broadcast media will also become redundant. Radio stations, TV channels, newspapers and journals will no longer serve any purpose. Once again, highly sophisticated information management tools will retrieve information from the massive range of disparate original sources that will come into existence, with the output collated, rationalized and customized to match the particular requirements of each networked individual.

These changes lie in the future, but are inevitable, and are likely to result in commercial upheaval and colossal social changes. At present, however, there remains a pressing need for a consistent and appropriate system or method to permit the implementation of this trade in information. The system must conform to, and operate under, the conditions that exist within free-market commercial and national economies. It is the development of a proposed solution to this [problem] problem, which is addressed by the present invention.

SUMMARY OF THE INVENTION

The PTP or "Packet Tariff Protocol" is an element within an effective system for digital networks at packet level. The protocol is envisaged as, but not limited to, an evolution of the existing TCP/IP (Transmission Control Protocol/Internet Protocol) standard that forms the core of the Internet as it presently exists. However PTP is not limited to TCP/IP applications, but can be used in any environment where there is transfer of data in distinct pieces or packets, for

example WAP (Wireless Application Protocol), UMTS (Universal Mobile Telecommunications System), GPRS (General Packet Radio Service) or others.

According to a first aspect of the present invention there is provided a method of electronic payment for data transferred across a computer network containing at least one client, at least one server and at least one router which forwards data, the method comprising the steps of:

sending an electronic data request from a client to a server via one or more routers; and

sending electronic data from [said] the server to [said] the client via one or more routers in response to [said] the electronic data request, [said] the electronic data having associated with it a data field containing a value which represents the commercial value of the data contained within the electronic data.

Preferably the electronic data is transmitted in the form of packets. Preferably each of [said] the one or more routers receives an incoming data packet, reads the value in the data field associated with the incoming data packet, calculates a new value based on the read value and the cost of forwarding the data packet, and forwards the data packet with the new value in the associated data field.

Preferably each of [said] the one or more routers checks whether the value in the data field associated with the incoming data packet falls within predefined parameters and rejects the packet if the value falls outside the predefined parameters. The parameters may depend on the source of the data packet or the originator of the data request.

The electronic data request may also have associated with it a data field containing a [value] value, which represents the commercial value of the data contained within the electronic data request.

Preferably total accumulated values for transactions between routers or between routers and servers/clients are recorded. These total values may be used as the basis for payments between the operators and/or users of the routers, servers or clients. Periodic clearance payments may be made between the operators and/or users of the routers, servers or clients, the clearance payments corresponding to the total accumulated values.

According to a second aspect of the present invention there is provided a system of electronic payment for data based on a hardware infrastructure of linked routers, data providers and data users, comprising:

at least one client;

at least one server for providing electronic data in the form of data packets in response to a request from a client and having its operation governed by a server protocol which causes each data packet sent by the server to have associated with it a data field representing the value of the data contained within the packet;

at least one router linked by a hardware infrastructure to [said] the server and [said] the client and having its operation governed by a routing table and a router protocol; and

whereby the router protocol causes each router to add commercial value to the packet by forwarding it in accordance with the routing table and to update the value contained in the data field within the packet to reflect this added commercial value.

Preferably the router protocol also includes procedures for rejecting individual packets in accordance with pre-defined parameters related to the value of each packet on receipt.

According to a third aspect of the invention there is provided a method of electronic payment for data transferred across a computer network containing at least one client, at least one server and at least one part of the network which forwards data, the method comprising the steps of:

sending an electronic data request from a client to a server via the part of the network; and

sending electronic data from [said] the server to [said] the client via the part of the network in response to [said] the electronic data request, [said] the electronic data having associated with it a data field containing a value which represents the commercial value of the data contained within the electronic data.

Preferably the electronic data is transmitted in the form of packets. Preferably the part of the network has an associated data processor which reads the value in the data field associated with an incoming data packet received by the part of the network, calculates a new value based

on the read value and the cost of forwarding the data packet, and forwards the data packet with the new value in the associated data field.

The data processor may check whether the value in the data field associated with the incoming data packet falls within predefined parameters and rejects the packet if the value falls outside the predefined parameters.

According to a fourth aspect of the invention there is provided a method of electronic payment for requested data transferred across a computer network containing at least one client, at least one server and at least one router which forwards data, in which the requested data is sent from [said] the server to [said] the client in the form of a packet,

wherein [said] the packet comprises a packet header and packet data,

the packet data containing the requested data, and

the packet header containing one or more address fields containing address information relating to the client and/or server and a data field containing a value which represents the commercial value of the requested data contained within the packet data.

Preferably the data is sent via the router which reads the value in the data field of the incoming data packet received by the router, calculates a new value based on the read value and the cost of forwarding the data packet, writes the new value to the data field, and forwards the data packet with the new value in the data field.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described, by way of example only, with reference to the accompanying figures, where:

Fig. 1 is a schematic representation of a typical generic form of a digital data packet under the system of the invention;

Fig. 2 is a schematic representation of a fragment of a network; and

Fig. 3 is a flow chart showing the operation of a network router under the system according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

The invention can best be understood by considering the metaphor of the supply chain with associated added value at each stage. In other words, at each step in the process to supply the information, value is added over and above the intrinsic value of the information. Therefore, an additional cost is associated with the information at each stage, until it reaches its ultimate destination. In practice, this is achieved by the incorporation of a "value" field into each data packet, allied with network protocol extensions to implement and utilize this field in the packet. This is applied in a way that ultimately results in the cost of providing the intrinsic information and the cost of providing the transport service being enumerated and accrued in the value field. These costs are thus accounted for within the same system that actually provides the data transport service, so that the supply chain and the value chain are both incorporated into the network protocols.

The value field may be augmented with a "priority" field, along the lines that have already been proposed by other bodies as part of existing technical specifications. Within this framework though, the priority field can additionally be used as part of the commercial system if required, so that different services can incur different costs although they may share the same hardware and network infrastructure. In some prior art developments, the "priority" field of a data packet has evolved to serve a more advanced purpose, and the field contains a code that indicates how data should be handled, according to its characteristics. For example, transmission of data that is part of a video stream might not be re-tried if it fails first time, since a degraded video output is considered to be more useful to the ultimate end-user than a pause to wait for all the information to achieve perfect reproduction. In contrast, a file transfer can usually wait for the availability of network capacity, but must ultimately be one hundred percent complete, accurate and checked if it is to be of practical use.

In the system according to the invention, data is transferred between servers and clients in packets. Fig. 1 shows the typical generic form of a digital data packet under the implementation of PTP.

The packet 10 is simply data in a mutually understood format. In the example of Fig. 1, it is divided into three sections 1, 2, and 3. Each section may be further divided into multiple fields, as described below. The packet header 1 contains general fields 4 for addressing information or other information and also contains a value field 5. The number of general fields 4 depends on the protocol used, and it is to be understood that the number of general fields 4 and the position of the value field 5 within the packet header 1 may vary. The packet data 2 contains the data 8 and follows the packet header 1. The packet tail 3 follows the packet data 2 and is optional, but would typically contain a field 6 containing the checksum for the packet, or similar error detection information, and may contain other general fields 7. Again it is to be understood that the number of general fields 7 and the position of the checksum field 6 within the packet tail 3 may vary. It is to be understood that the value field may be in any position within the packet, for example within the payload or packet data 2, or within the packet tail 3.

Each data packet 10 includes a value field 5, which contains information about the intrinsic value of the data 8 contained within the packet, and which accumulates the charges made for each step in the provision of the service for supplying that data packet to its ultimate recipient. As an example, this aggregated overall worth may be measured in Network Credit Units (NCU's).

For the purpose of applying tariffs, the network system is considered to consist of "servers", "routers" and "clients" although in practice a single machine or even a single software application may [fulfil] fulfill more than one of these functions at different times. For example, a router can be considered to be acting as a client to many servers and as a server to many clients, as defined by the routing tables to which it adheres at any particular moment in time.

Fig. 2 is a diagram showing a network fragment. Under the system of the invention it may operate in the following manner. The web client 20 operated by the ultimate end user requests information in the form of a message that passes through router (N) 22 at the internet service provider (ISP) connection and accrues added value as a result of the action of the transport service. The message subsequently passes through a number of intermediate routers (not shown) and finally through router (A) 24 and accrues more added value for the extra

transport service. The intermediate routers and routers (A) and (N) form the network infrastructure carrying the data. The message then arrives at the web server 26, which responds by initiating a data stream. The web server 26 is operated by a content provider. The packets of this data stream typically have intrinsic value, associated with the information that they contain, the information being provided or sold by the content provider. The appropriate component of this intrinsic value is recorded in each packet. The packets then pass back via router (A) 24 and have the associated value of the transport service added to them. Similarly, router (N) 22 passes the data stream and adds further value to the packets for the service provided. The information finally arrives at the web client 20, as required.

For each machine on the network, the net values of packets received and transmitted via each hardware connection can then be calculated. These values are reconciled by the owners of all the machines involved, as the basis for assessing the economic value of the services provided and calculating the commensurate hard currency exchanges required. This process is described in more detail below.

In accordance with the PTP idea, the web client 20, or any software application functioning as a client, maintains the right to reject individual packets if they are deemed "too expensive" by some criteria, without assuming their associated notional cost. Additional control is maintained by monitoring the value of incoming packets in real time, typically by summing the total value arriving in the last second and/or minute and/or hour and/or other time interval, as required. This might, for example, be depicted by a meter representation or bar indicator on a network terminal screen. Over a short time period, of the order of a few seconds or so, it might be acceptable to have a large amount of data arriving with a large value at a high rate of value accrual, for example when downloading a software application. However over a longer time period, of the order of an hour or so, a high rate of value accrual might be unacceptable while it might be acceptable to have a continuous stream of data arriving with a smaller value, for example when downloading a movie or video in real time. A meter representation could also apply to an Internet telephone, and the system could show the cost of a call as it takes place, rather than the owner subscribing to the service on a predetermined tariff scheme. This does not

preclude a service provider agreeing to absorb the fluctuations in cost and passing on packets at agreed rates if such a service is desired by clients on the network. This might be appropriate, for example, if a client actually desired predetermined costs for use of the system, e.g., for budgeting purposes.

The invention is now described in more detail. For the purposes of the description herein, a packet originates from a server that acts as a "content provider", i.e., it is the source of the data or information contained within the packet that is to be transferred. This piece of information and the service of providing it both have some inherent worth and this worth can be enumerated and written in the value field of the packet. This is the first element of the system of the present invention, in that content providers can attach a value to the information that they provide and, further, they can assert the claim to that value along the same delivery channel as that by which the information itself is supplied. On receipt of the packet, the client (or router acting as a client) can accept the packet or reject it. The control [system] system, which makes the decision and determines the outcome of this choice is described later. It is of importance, because information cannot meaningfully be returned once received.

Assuming that a router receives and accepts a packet, it then acts in its role as a server and forwards it in accordance with the routing tables it currently holds. It should be noted that this always entails sending the packet down a physical data connection of some sort. The network is defined by the routing tables, but always has a physical existence as data conduits between machines. In the system of the invention, the routing machine defines the worth associated with the action of passing a packet from one machine to the next. It might be a fixed rate, or it might be dependent on the priority of the packet or on some other parameters (e.g., network loading, time of day, physical distance between machines, available bandwidth, ownership of network infrastructure, etc.). The important point is that this evaluation can be resolved by the router (probably as part of its routing software) as it passes the packet and that the outcome of this calculation is added to the value field of the packet in transition (i.e., before it is forwarded). This is the second element of the system of the present invention, in that network infrastructure providers can attach a value to the service of transporting information and,

further, they can assert the claim to that value along the same delivery channel as that by which the information itself is supplied. It is also necessary for each machine to accumulate the total number of NCU's it receives from each physical connection and the total number of NCU's it dispatches to each physical connection, excluding those attributed to packets that are subsequently rejected. It should also be noted that physical connections for the receipt of packets are considered to be distinct from physical connections for the dispatch of packets, even though they might be manifested in the same piece of cabling.

Under these conditions, the number of NCU's transmitted from the machine at one end of a physical connection should agree with the number of NCU's accepted by the machine at the other end. These machines may be owned by different organizations but, on the basis that they agreed to make the trades, they should be reasonably expected to have mutual interest in ensuring accuracy in accounting. A commercial analogy for this would be a deal done on an "open outcry" trading floor, in which two parties agree a deal by signals and each makes a record of it independently. The independent records are reconciled at a later stage but, since both parties agreed the initial deal, both are assumed to have an interest in making sure that it is recorded accurately. The analogy goes further, since any party that establishes a reputation for not recording deals accurately will simply find it impossible to establish or maintain any profitable trades.

Within this protocol, any recipient reserves the right to reject any packet. This rejection includes refusal to accept the debt associated with receipt of the packet. The most probable reason for this is that the packet is deemed by some criteria to be "too expensive". This act of rejection is an important part of the protocol and therefore warrants detailed discussion. As discussed above, once data is received it cannot be meaningfully returned, since it is not a physical object. On first inspection, then, it seems that there would be a propensity to defraud suppliers by rejecting packets (and therefore the liability to pay for them) whilst still forwarding the data and charging for it. However, the post-receipt rejection process is vital to remove completely the possibility that single "rogue" packets of massive value are foisted on unsuspecting recipients. The reason that an immediate breakdown of the system according to the

invention does not follow is because successful trading requires streams of many packets of modest value to be passed through the network. In the proposed scenario, the "catch 'em once" price-value combination is excluded by this ability to refuse to pay for excessively costly packets. This means that a sustainable and profitable trade will only occur with the transmission of an ongoing packet stream.

This "reject" aspect of the system according to the invention may best be understood by considering a "sale or return" analogy. A producer (content provider) creates a product (data/information) and delivers it to a reseller (router) at some cost (the value in NCU's). The reseller (router) either accepts it, on the basis that it can be sold on (forwarded to another router or an end client) at a marked up price (an addition to the value in NCU's) or, alternatively, rejects it. The producer (content provider) monitors the rejections of the reseller (router) and decides on the basis of this information whether or not to continue trading and, if so, what price structure to apply. Hence, the choice of acceptance or rejection of a packet is effectively a "sale or return" of the data, since keeping occasional packets without paying for them is of little economic value. In practice, it will rapidly become the case that meaningful trade in packet streams allied to competitive pricing is the only way to maintain profitable transactions.

Termination criteria are based upon single packet costs and the cost accumulations of packets over selected time intervals. Hence termination requests are issued if any single packet exceeds the NCU threshold or if the limits for NCU's per second, minute, hour, day and/or other time interval are exceeded. The cut-off levels are best kept confidential to avoid prices being bumped up to the maximum that would be accepted, although such information could be shared with trusted counterparts in an attempt to reject packets deemed too costly at an earlier stage. Note that single-packet rejection is the only rejection where packets are not paid for, other termination is simply a request to cease supplying data. Data received before supply terminates are still paid for, subject to single packet criteria.

Conversely, the value attributed to data by content providers could be freely advertised. This would make competition between content providers more effective and would also highlight expensive transport routes, since the value of the packet received would have had risen

unacceptably when compared to the initial value advertised by the content provider. Furthermore, data network routing should become an extremely efficient market because data transmission networks can be reconfigured so easily and pricing structures changed so readily. This should result in perfect competition, evolving to satisfy the laws of supply and demand in a free market.

The final element of the system according to the invention is achieved by converting the residual difference in NCU's exchanged between a pair of machines over some physical connection into a payment in mutually acceptable hard currency. This can always be achieved bilaterally, but could also be administered by some kind of clearing house with responsibility for a defined physical region of the network. There is a potential problem here, unless the exchange value of an NCU is pegged to some hard currency. Otherwise, it will float erratically as the number of NCU's per network transaction can vary inversely with the exchange rate to hard currency, without changing the actual monetary worth of the network transaction. The problem might however eventually resolve itself if the NCU becomes a stable, global currency in its own right.

To complete a transaction using this system, an ultimate client could first issue a request for some information. For the purpose of this example only, it will be assumed that this request is contained in a single packet. The intrinsic value of this packet would probably be zero but, in all cases, could not exceed a predetermined maximum accepted by the router (which may well be the machine of a network service provider, acting at this point as a client). Further, since this machine is probably not owned by the owner of the ultimate client machine, there would be no tariff added to the value of the packet. The router, now acting as a server, adds a tariff to the packet and passes it to the next router. This process is repeated across the network until the packet reaches the machine of the content provider that, somewhat confusingly, is at this point acting as a client. Hence, the content provider receives a request for information but becomes liable for the accrued value of the packet. This value will be relatively small, since it is only one packet (or, more generally in practice, a relatively small number of packets) and it has little or no intrinsic value in its information content. It can be thought of as analogous to the cost associated

with a free-phone telephone number that businesses commonly use to attract enquiries from customers.

The machine of the content provider now acts in its primary role as a server, and starts to send packets addressed to the machine of the ultimate client (i.e., the machine from which the original request for data originated). Since the packets have content that is deemed to have some worth, these packets now have a significant value associated with them even as they are dispatched from the server machine. As they traverse the network, they will accrue further value until they reach the ultimate client machine. Routers within the network will have added value to packets passing both ways, so that owners of these machines will be in residual credit after paying for the packets received and will therefore be able to reclaim hard currency converted from NCU's to finance their activities. The content providers will have some liabilities for the receipt of the packets requesting data but will have a large residual credit for supplying the information. The ultimate client will contribute the majority of the payments due, which cover the cost of the information they receive and the cost of the process of transporting it to them.

The way in which a network router might implement the PTP, in addition to its existing transport protocol, for the purposes of transferring data packets and accumulating the associated tariffs, is illustrated in the flow chart of Fig. 3. The branches in the flow chart show possible contingencies at various stages, if the required conditions are not satisfied.

The router receives 30 a data packet and checks 32 whether the packet is acceptable under the existing transport protocol. The router also checks 32 whether the routing tables with which it is provided can resolve the address to yield the hardware connection along which the packet is to be dispatched. If the packet is acceptable and the address can be resolved the router proceeds to step 36. If the packet is not acceptable or the address cannot be resolved the router rejects 34 the packet.

The router then checks 36 that the value of the packet as determined from the value field 5 is below the value limit acceptable from the incoming hardware connection. If the value of the packet is not below the value limit the router rejects 38 the packet under the PTP rules. If the value of the packet is below the value limit the router proceeds to the next step, in which the

recorded total value received from this hardware connection is incremented 40 by the value of the packet. The recorded total value received is stored by the router.

The router then calculates 42 the value to be added for the service of transmitting this packet along the particular hardware connection designated by the routing tables. This might depend upon the infrastructure of the hardware connection, the prevailing network loading, the time of day and many other factors. The router then increments 44 the packet's value field [5] 5, which is the packet's internal record of its own value by this calculated value.

The router then transmits 46 the packet along the hardware connection along which the packet is to be dispatched. Following transmittal the router checks 48 that the recipient machine has acknowledged successful transfer of the packet (assuming the transfer protocol supports this). If the transfer is not successful, then this is handled under the existing transport protocol 50. If the transfer is successful the router increments 52 the recorded total value transmitted to this hardware connection by the value of the packet. The recorded total value transmitted is stored by the router.

For each router or hardware connection, the total value transmitted minus the total value received (e.g., in Network Credit Units) is the net profit (or loss) that must be reconciled with the owner of the machine at the other end of that hardware connection. This is used to determine the economic value of the accumulated transactions and forms the basis of the hard currency exchanges necessary to finance the activities and the provision of the infrastructure.

Physical network connections can be created and re-arranged relatively easily and network service providers can normally be changed at will. It is therefore anticipated that the kind of business system envisaged by the present invention will lead to a very efficient market constituted of very many providers of connections and routing bandwidth who serve, collectively, a very large number of content providers and information consumers. For example, if the financial arrangements were controlled in this manner, it might reasonably be envisaged that the infrastructure would evolve to support video on demand. This would be based upon an enormous supply of material, effectively a distributed archive of all the material ever produced. It would satisfy the market by the laws of supply and demand.

One of the major problems associated with any data distribution, and particularly digital data, is that of unauthorized redistribution. Matters of privacy and security are also general problems in the context of the Internet. For the purposes of the description of the invention, it is necessary only to consider whether the use of PTP implies any changes as compared to the situation at present. The system of the invention does not require transfer of data in ways other than those presently possible, and the proposed protocol of the invention would not inhibit any of the security or encryption methods used to prevent such [unauthorised] unauthorized redistribution. In fact, security and encryption would be expected to take place at the level of the data within the packet stream, rather than acting at the packet level itself.

One important feature of the system of the invention is that it allows consumers to choose exactly what they require without having to pay for unwanted accompanying material. For example, they can select one track without having to pay for a complete music CD, or they can decide not to view the remainder of a film if they dislike the opening portion. Also, the purchase price should be subject to very keen competition. These facts in themselves mean that there is less temptation to acquire material from illegal sources. Any legal deterrents become more effective if individuals can buy selectively only what they actually require, and at a fair price.

In addition, as individuals are presented with, and begin to utilize, the much greater choice of available information, their interests will rapidly diversify and their requirements will diverge. This will have the effect of making it more difficult to cache data as it passes through the network and resell it multiple times. If content becomes sufficiently cheap, it will not be worth the investment in hardware to cache it. There will be less demand for any particular content, so that the logistics of illegal storage for reselling become more expensive and therefore less attractive. This is not to say that a legal business of caching and reselling popular information could not build up, still within this framework. This could, for example, be how what are now broadcast services continue to make money. Network capacity will need a large step-change before commonly required content can be served to all clients from a single source, a matter which is presently addressed by the use of network caches, proxy servers and mirror sites on the Web. Such issues are tied in with copyright and ownership of content. For example,

it is not generally possible for an end-user to tell whether content comes from its original provider or from some legitimate or illegitimate cache. Once again, the implementation of the system of the invention would not impact upon these matters of copyright and ownership of content.

The system of the invention as described above can also function with the concept of the network computer, which for example means that a user might have the option of purchasing the use of a software application for some period rather than actually buying the application outright. Once again, they receive (and pay for) only what they actually require, and always get the most up to date version so that rapid obsolescence is not a concern.

One other important feature of the PTP concept is that it can be interfaced with a conventional network, operating under a different business model, provided charging rates and so forth are agreed for the interfaces. This means that network fragments can be created or converted to conform to the PTP model as and when suits the infrastructure owner, so that gradual conversion is possible and a massive "roll-out" program is unnecessary.

It is possible that, for effective operation, the system of the invention will require international financing deals and clearing arrangements, as well as software controlled real-time network configuration changes and real-time pricing structure changes. However, the system of the invention offers two significant advantages, as follows. Firstly, the ultimate client always has transparent data on what the service being received is actually costing, over any desired time interval. This is regardless of the choice of information source, network service or demand driven costing changes. Secondly, PTP represent a good approximation to a perfectly competitive and efficient market, and one in which the costs and revenues are intimately related at all stages to the actual activities from which they result. These features should be expected to encourage serious investment into infrastructure development.

Particular details of a method of implementing PTP in a TCP/IP environment will now be described. In particular, for the value quantity to be directly accessible for processing by the routers, the value field must be contained in the IP Layer header. This is because the TCP Layer header is considered purely as data by the routers that implement IP protocols and, as such, it is

to be transported without any reference to its contents. However, for the value field to be useful to individual client and server applications for the purpose of enumerating the intrinsic worth of the data being transported, it must be accessible to these applications. The applications operate at the Application Layer of the TCP/IP stack and this layer interfaces with the TCP Layer, with the IP Layer being effectively invisible to the application. The matter is further complicated by the existence of UDP (User Datagram Protocol), which provides an alternative protocol at the Transport Layer (and there might be additional alternatives, which either currently exist or will be defined in the future). The invention proposes three solutions to this, as follows.

The first solution is to have separate value fields. According to this solution there are two distinct value fields, one in the IP Layer, to accrue measurement of the economic worth of performing the data transport operation, and one in the Transport Layer, to enumerate the intrinsic worth of the data. Such a solution does not allow the unification of the methods covering the two contributions to the economic model, and so is not the preferred solution.

The second solution is direct communication between the application and the IP Layer. Such communication can be hazardous with respect to the structure and implementation of the TCP/IP protocol and is not generally considered to be a realistic solution. There is a useful exception in the case of an "information server", a system dedicated to serving information on behalf of a content provider and which is accessed by a client dedicated to the task of receiving that information. A server in such a system can run [customised] customized application software, in which the direct access to the IP Layer is available as required. The client works solely with the incoming information, so that the resources consumed (and measured in accordance with PTP) on behalf of the client application are indistinguishable from the total resources consumed by the client machine. This is the maximum level of detail that could be measured if the PTP values were accessed directly from the IP Layer, since IP does not work with reference to specific ports or the individual applications which are notionally attached to them.

The third, most [favoured] favored solution is integration with the Transport Layer. The PTP value field is incorporated in the IP Layer header. The Transport Layer protocol (TCP,

UDP or other) is aware of the value field and can convey the information to and from the Application Layer as required, even though this information is not written in the Transport Layer header and thus not considered to be conveyed at the Transport Layer level. The act of reading and writing the value field would still be expected to be the preserve [of the] of the IP Layer implementation software. This structuring appears to be analogous to the way in which applications can have access to IP addresses, although these are actually written in to, and read back from, the IP headers.

Practical details in implementing the router functionality required by the PTP system will now be described. Incrementing the value field does not impose an unacceptable processing overhead on the router. There is a precedent for this kind of processing in the way that the IP standard defines and [utilises] utilizes a time-to-live (TTL) value in the IP header. This is subject to a decrement each time a router hop occurs. This capability can be extended to include a simple addition to the value field at the same point in the processing. This operation is likely to be an integer addition or binary add function on a specific bit field in the packet header, a relatively straightforward procedure. At the same time developments in hardware technology will go some way to compensating for the increased burden placed upon the network infrastructure by the implementation of PTP. Dedicated hardware may be used to support the value field modification. Since there is an intimate relationship between the physical network connections and the particular value of the increment to be applied, an appropriate piece of equipment can be placed "in line" on each physical network connection, to perform the task. Such a unit can respond to its own communications protocol (something akin to the way routers work with ICMP (Internet Control Message Protocol), ARP (Address Resolution Protocol) and RARP (Reverse Address Resolution Protocol)) to receive updates to the algorithm for the value to be added to passing packets and also to return accumulated totals at appropriate times. Otherwise it operates as a standalone piece of network infrastructure, logging and incrementing the values of passing packets. Such a configuration alleviates the need for routers to allocate the accumulating values to particular network connections or IP addresses in real time, as they process the packets.

In addition, it is also possible that, rather than each and every router performing its own increment to the value field, a more "coarse grained" implementation of the PTP model could be applied. This would occur if the provider of a particular piece of infrastructure were willing to consider that piece of infrastructure (e.g., an optical [fibre] fiber "backbone") as a zone and therefore apply a more straightforward tariff for transportation across the zone. This would mean that the logging and increasing of the value fields of packets transported across the zone would only need to take place at the zone boundaries. This scheme is effectively equivalent to considering the flow chart of Fig. 3 to apply to a network zone rather than an individual router.

These and other modifications and improvements can be incorporated without departing from the scope of the invention.

CLAIMS

1. A method of electronic payment for data transferred across a computer network containing at least one client, at least one server and at least one router which forwards data, the method comprising the steps of:

sending an electronic data request from a client to a server via one or more routers; and

sending electronic data from said server to said client via one or more routers in response to said electronic data request, said electronic data having associated with it a data field containing a value which represents [the] a commercial value of [the data contained within] the electronic data.

2. [A] The method according to Claim [1] 1, in which the electronic data is transmitted in the form of packets.

3. [A] The method according to Claim 2, wherein each of said one or more routers receives an incoming data packet, [reads the value in the] containing electronic data and a data field associated with the electronic data in the incoming data packet, reads the value in the data field, calculates a new value based on the read value and the cost of forwarding the data packet, and forwards the data packet with the new value in the associated data field.

4. [A] The method according to Claim 3, wherein each of said one or more routers checks whether the value in the data field associated with the electronic data in the incoming data packet falls within predefined parameters and rejects the packet if the value falls outside the predefined parameters.

5. [A] The method according to [any preceding Claim,] Claim 1, wherein the electronic data request has associated with it a data field containing a [value] value, which represents the commercial value of the data contained within the electronic data request.

6. [A] The method according to [any preceding Claim,] Claim 1, wherein total accumulated values for transactions between routers or between routers and servers/clients are recorded.

7. [A] The method according to Claim 6, wherein clearance payments are made between the operators and/or users of the routers and servers/clients, the clearance payments corresponding to the total accumulated values.

8. A system of electronic payment for data based on a hardware infrastructure of linked routers, data providers and data users, comprising:

at least one client;

at least one server for providing electronic data in the form of data packets in response to a request from a client and having [its] the at least one server's operation governed by a server protocol which causes each data packet sent by the server to have associated with it a data field representing the value of the data contained within the packet;

at least one router linked by a hardware infrastructure to said server and said client and having its operation governed by a routing table and a router protocol; and

whereby the router protocol causes each router to add commercial value to the packet by forwarding it in accordance with the routing table and to update the value contained in the data field within the packet to reflect this added commercial value.

9. [A] The system according to Claim 8, wherein the router protocol also includes procedures for rejecting individual packets in accordance with pre-defined parameters related to the value of each packet on receipt.

10. A method of electronic payment for data transferred across a computer network containing at least one client, at least one server and at least one part of the [network] network, which forwards data, the method comprising the steps of:

sending an electronic data request from a client to a server via the part of the network; and

sending electronic data from said server to said client via the part of the network in response to said electronic data request, said electronic data having associated with it a data field containing a value which represents the commercial value of the data contained within the electronic data.

11. [A] The method according to Claim [10] 10, in which the electronic data is transmitted in the form of packets.

12. [A] The method according to Claim 11, wherein the part of the network has an associated data processor which reads the value in the data field associated with an incoming data packet received by the part of the network, calculates a new value based on the read value and the cost of forwarding the data packet, and forwards the data packet with the new value in the associated data field.

13. [A] The method according to Claim 12, wherein the data processor checks whether the value in the data field associated with the incoming data packet falls within predefined parameters and rejects the packet if the value falls outside the predefined parameters.

14. A method of electronic payment for requested data transferred across a computer network containing at least one client, at least one server and at least one router which forwards data, in which the requested data is sent from said server to said client in the form of a packet, wherein said packet comprises a packet header and packet data, the packet data containing the requested data, and

the packet header containing one or more address fields containing address information relating to the client and/or server and a data field containing a value which represents the commercial value of the requested data contained within the packet data.

15. [A] <u>The</u> method according to Claim 14, wherein the data is sent via the router which reads the value in the data field of the incoming data packet received by the router, calculates a new value based on the read value and the cost of forwarding the data packet, writes the new value to the data field, and forwards the data packet with the new value in the data field.

[ABSTRACT]

ABSTRACT OF THE DISCLOSURE

A method of electronic payment for data transferred across a computer network from a server [(26)] to a client [(20)] by means of at least one router [(22, 24)] which forwards data. An electronic data request is sent from the client to the server via one or more routers. The server [(26)] then sends electronic data [(8)] to the client [(20)] via one or more routers in response to said electronic data request. The electronic data is sent via a packet transfer protocol, in which each packet of data [(10)] has associated with it a data field [(5)] containing a [value] value, which represents the commercial value of the requested data [(8)]. Each router [(22, 24)] receives an incoming data packet [(10)], reads the value in the data field [(5)] associated with the incoming data packet, calculates a new value based on the read value and the cost of forwarding the data packet, and forwards the data packet [(10)] with the new value in the associated data field [(5)]. Each router can check whether the value in the data field [(5)] associated with the incoming data packet falls within predefined ["parameters".] parameters and rejects the packet if the value falls outside the predefined parameters, for example if the value of the data is too high. Each router stores the accumulated value of received and forwarded data, so that payments may be made to the operator of the router.

Fig. 1

Fig. 2

30 RECEIVE PACKET

32 CHECK UNDER EXISTING TRANSPORT PROTOCOL → 34 REJECT PACKET

36 VALUE BELOW LIMIT? → 38 REJECT PACKET

40 INCREMENT TOTAL RECEIVED VALUE RECORD

42 CALCULATE ADDED VALUE

44 INCREMENT PACKET VALUE RECORD

46 TRANSMIT PACKET

48 IS TRANSFER SUCCESSFUL? → 50 EXISTING TRANSPORT PROTOCOL

52 INCREMENT TOTAL TRANSMITTED VALUE RECORD

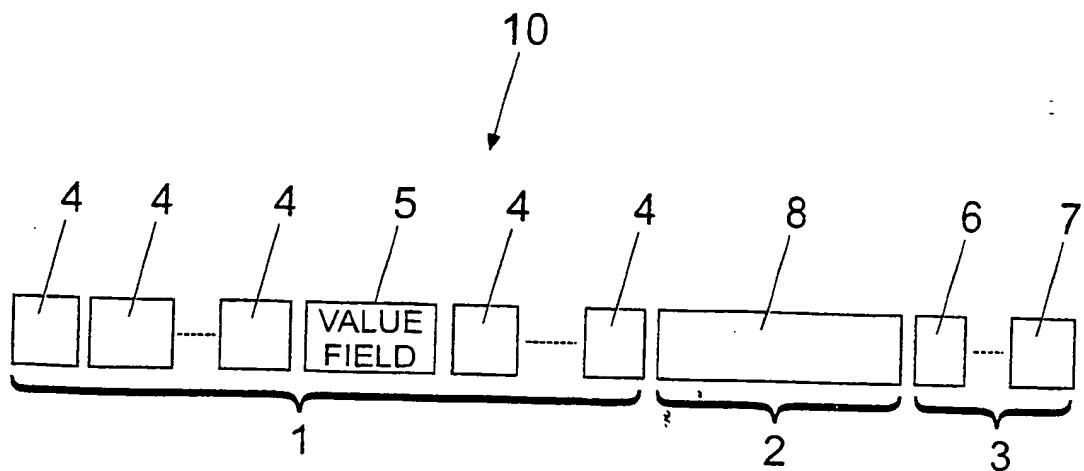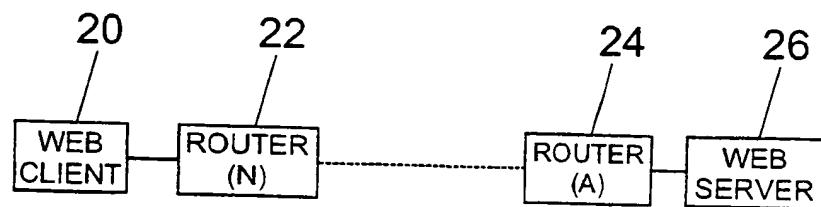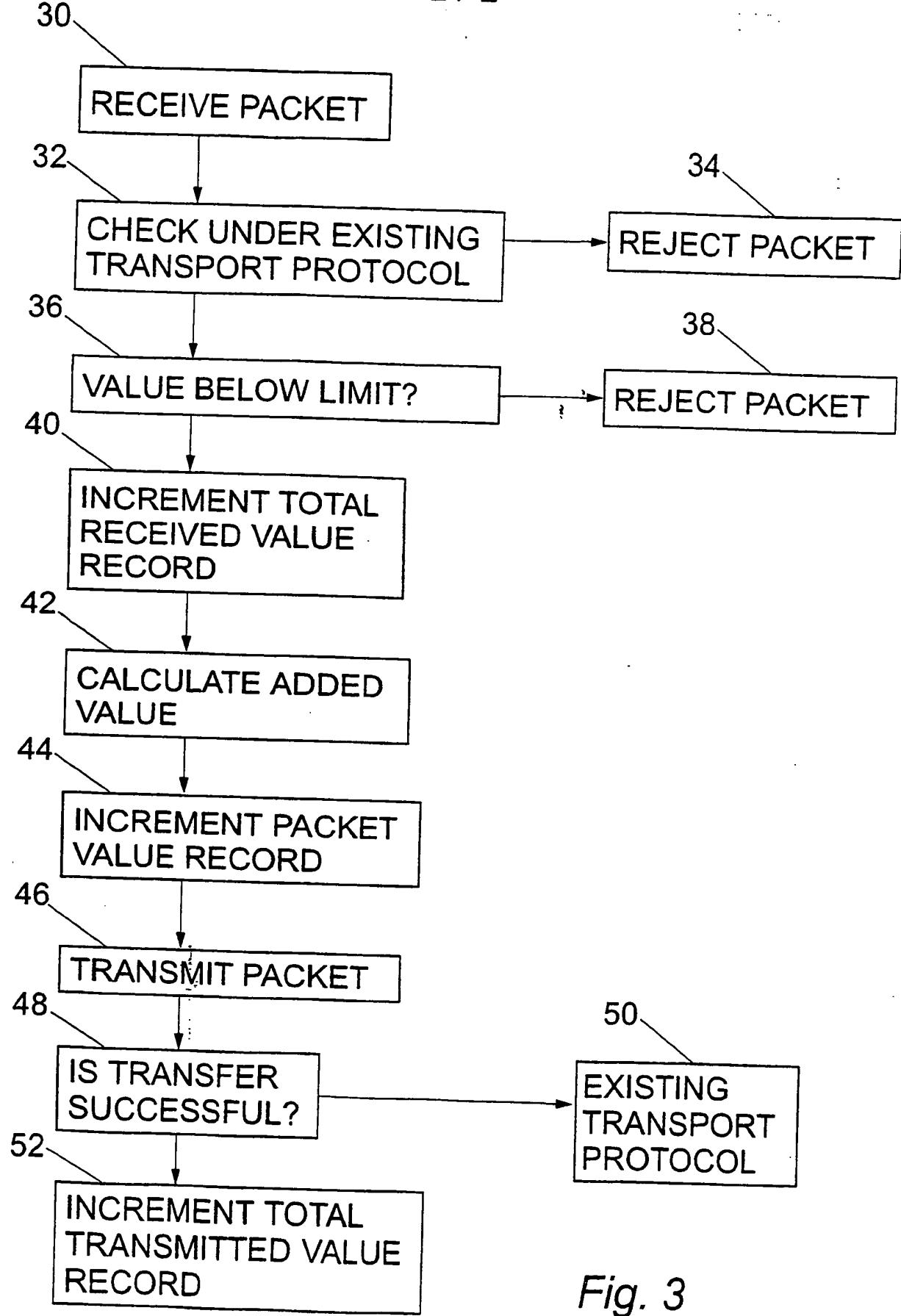*Fig. 3*

APPENDIX C

United States Patent and Trademark Office <u>OG Notices: 05 February 2002</u>

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Some correspondence may only be submitted via the Office's electronic filing system (EFS). For example, the following publication requests must be submitted via EFS:

a request for publication of an application as amended during examination (37 CFR 1.215(c));

a request for redacted publication (37 CFR 1.217(b));

a request for voluntary publication of an application filed before November 29, 2000 (37 CFR 1.22(a)); or

a request for republication of an application that has already been published (37 CFR 1.22(a)).

Instructions on how to file such an application request via EFS are located on the Office's Electronic Business Center on the Office's Internet Web site http://www.uspto.gov <http://www.uspto.gov>) under the Electronic Business Center section.

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Box Designations	Explanation
Box REISSUE	All new and continuing reissue application filings.
Box 12	Contributions to the Examiner Education Program.
Box 313(b)	Petitions under 37 CFR 1.313(c) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for a continuing application or a request for continued examination (RCE).
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box CPA	Requests for Continued Prosecution Applications (CPA's) under 37 CFR 1.53(d).
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and

	petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box Design	The filing of all design patent applications which do not request expedited examination under 37 CFR 1.55.
Box Expedited Design	Only to be used for the initial filing of design applications accompanied by a request for expedited examination under 37 CFR 1.155. (Design applicants seeking expedited examination may alternatively file a design application and corresponding request under 37 CFR 1.155 by hand-delivering the application papers and request directly to the Design Group Director's office.)
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection.)
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PGPUB	Correspondence regarding publication of patent applications not otherise provided.
Box PGPUB - ABD	Petitions under 37 CFR 1.138 to expressly abandon an application to avoid publication of the application.
Box PGPUB DRAWINGS	Drawings to be included in a patent application publication (replacement drawings for drawings included with a patent application on filing).
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
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Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for original request papers only.
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or application number for patent applications prior to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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APPENDIX D

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PTO/SB/18 (08-00)
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UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	717901.20
First Named Inventor	Stringer, Andrew Mark
Title	COMPUTER NETWORK PAYMENT SYSTEM
Express Mail Label No.	EL493158870US

APPLICATION ELEMENTS
See MPEP chapter 600 concerning utility patent application contents.

ADDRESS TO: Assistant Commissioner for Patents
Box PCT
Washington, DC 20231

1. ☒ Fee Transmittal Form (e.g., PTO/SB/17)
   (Submit an original, and a duplicate for fee processing)
2. ☒ Applicant claims small entity status.
   See 37 CFR 1.27
3. ☒ Specification [Total Pages 51]
   (preferred arrangement set forth below, MPEP 1503.01)
   - Descriptive title of the invention
   - Cross Reference to Related Applications
   - Statement Regarding Fed sponsored R&D
   - Reference to sequence listing, a table, or a computer
   - program listing appendix
   - Background of the Invention
   - Brief Summary of the Invention
   - Brief Description of the Drawings *(if filed)*
   - Detailed Description
   - Claim(s)
   - Abstract of the Disclosure
4. ☒ Drawings (37 U.S.C. 113) [Total Sheets 2]
5. Oath or Declaration [Total Pages   ]
   a. ☐ Newly executed (original or copy)
   b. ☐ Copy from a prior application (37 CFR 1.63(d))
      (for continuation/divisional with Box 18 completed)
      i. ☐ DELETION OF INVENTOR(S)
         Signed statement attached deleting
         inventor(s) named in the prior application, see
         37 CFR 1.63(d)(2) and 1.33(b)
6. ☐ Application Data Sheet. See 37 CFR 1.76

7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program *(Appendix)*
8. Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all necessary)*
   a. ☐ Computer Readable Form (CRF)
   b. Specification Sequence Listing on:
      i. ☐ CD-ROM or CD-R (2 copies); or
      ii. ☐ paper
   c. ☐ Statements verifying identity of above copies
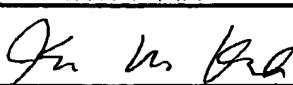
ACCOMPANYING APPLICATION PARTS

9. ☐ Assignment Papers (cover sheet & document(s))
10. ☐ 37 CFR 3.73(b) Statement   ☐ Power of Attorney
    (when there is an assignee)
11. ☐ English Translation Document *(if applicable)*
12. ☒ Information Disclosure Statement (IDS)/PTO-1449   ☒ Copies of IDS Citations
13. ☒ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503) *(Should be specifically itemized)*
15. ☐ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*
16. ☐ Nonpublication Request under 35 U.S.C. 122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent.
17. ☒ Other: Check for $412.00; Certificate of Express Mailing

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation   ☐ Divisional   ☐ Continuation-in-part (CIP)   of prior application No.: _____/_____

Prior application information: Examiner _____   Group Art Unit: _____

For CONTINUATION or DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

19. CORRESPONDENCE ADDRESS

☒ Customer Number or Bar Code Label   (Insert Customer No. or bar code label here)   ☐ Correspondence address below

Name	Kevin M. Kercher				
Address	720 Olive Street 24th Floor				
City	St. Louis	State	Missouri	Zip Code	63101
Country	United States	Telephone	314-345-6000	Fax	314-345-6060

27128
PATENT TRADEMARK OFFICE

Name (Print/Type) Kevin M. Kercher	Registration No. (Attorney/Agent)	33,408
Signature		Date December 21, 2001

DEC 21 2001

BLACKWELL SANDERS
PEPER MARTIN

STLD01-908178-1

FEE TRANSMITTAL
for FY 2002
Patent fees are subject to annual revision.

Complete if Known	
Application Number	Not Yet Known
Filing Date	Herewith
First Named Inventor	Stringer, Andrew Mark
Examiner Name	Not Yet Known
Group Art Unit	Not Yet Known
Attorney Docket No.	717901.20

TOTAL AMOUNT OF PAYMENT	($)412.00

METHOD OF PAYMENT (check one)

1. ☒ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:

Deposit Account Number: **11-0160**

Deposit Account Name: **BLACKWELL SANDERS PEPER MARTIN LLP**

☒ Charge Any Additional Fee Required Under 37 CFR §§ 1.16 and 1.17

☐ Applicant claims small entity status. See 37 CFR 1.27.

2. ☒ Payment Enclosed:
☒ Check ☐ Credit card ☐ Money Order ☐ Other

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Fee ($)	Small Entity Fee Code	Fee ($)	Fee Description	Fee Paid
101	740	201	370	Utility filing fee	370
106	330	206	165	Design filing fee	
107	510	207	255	Plant filing fee	
108	740	208	370	Reissue filing fee	
114	160	214	80	Provisional filing fee	

SUBTOTAL (1) ($)370.00

2. EXTRA CLAIM FEES

		Extra Claims	Fee from below	Fee Paid
Total Claims	15	-20** = 0	x	= 0
Independent Claims	4	-3** = 1	x 42	= 42
Multiple Dependent				=

** or number previously paid, if greater. For Reissues, see below

Large Entity Fee Code	Fee ($)	Small Entity Fee Code	Fee ($)	Fee Description
103	18	203	9	Claims in excess of 20
102	84	202	42	Independent claims in excess of 3
104	280	204	140	Multiple dependent claim, if not paid
109	84	209	42	** Reissue independent claims over original patent
110	18	210	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL 2 ($)42.00

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Fee Code	Entity Fee ($)	Small Fee Code	Entity Fee ($)	Fee Description	Fee Paid
105	130	205	65	Surcharge - late filing fee or oath	
127	50	227	25	Surcharge - late provisional filing fee or cover sheet.	
139	130	139	130	Non-English specification	
147	2,520	147	2,520	For filing a request for *ex parte* reexamination	
112	920*	112	920*	Requesting publication of SIR prior to Examiner action	
113	1,840*	113	1,840*	Requesting publication of SIR after Examiner action	
115	110	215	55	Extension for reply within first month	
116	400	216	200	Extension for reply within second month	
117	920	217	460	Extension for reply within third month	
118	1,440	218	720	Extension for reply within fourth month.	
128	1,960	228	980	Extension for reply within fifth month	
119	320	219	160	Notice of Appeal	
120	320	220	160	Filing a brief in support of an appeal	
121	280	221	140	Request for oral hearing	
138	1,510	138	1,510	Petition to institute a public use proceeding	
140	110	240	55	Petition to revive – unavoidable	
141	1,280	241	640	Petition to revive – unintentional	
142	1,280	242	640	Utility issue fee (or reissue)	
143	460	243	230	Design issue fee	
144	620	244	310	Plant issue fee	
122	130	122	130	Petitions to the Commissioner	
123	50	123	50	Processing fee under 37 CFR 1.17(q)	
126	180	126	180	Submission of Information Disclosure Stmt.	
581	40	581	40	Recording each patent assignment per property (times number of properties)	
146	740	246	370	Filing a submission after final rejection (37 CFR § 1.129(a))	
149	740	249	370	For each additional invention to be examined (37 CFR § 1.129(b))	
179	740	279	370	Request for Continued Examination (RCE)	
169	900	169	900	Request for expedited examination of a design application	

Other fee (specify) _____

Other fee (specify _____

SUBTOTAL (3) 0

*Reduced by Basic Filing Fee Paid

($)412.00

SUBMITTED BY

Name (Print/Type)	Kevin M. Kercher	Registration No. (Attorney/Agent)	33,408	Telephone	(314) 345-6000
Signature				Date	December 21, 2001

Complete (If applicable)

STLD01-908181-1

APPENDIX E

THE
NEW LEXICON
WEBSTER'S
DICTIONARY
OF THE ENGLISH LANGUAGE

◆ ◆ ◆

female it comprises the two ovaries, the Fallopian tubes, the uterus and the vagina

re·pro·graph·ics (ri:prəgræfiks) *n.* the field of reproduction of documents, including input, editing, photocomposing, and reproduction; esp. for official use

re·prog·ra·phy (riprógrəfi:) *n.* document reproduction by electronic techniques, e.g., by photocopying —**reprographic** *adj.*

re·proof (riprú:f) *n.* a reproving or an instance of this [O.F. *reprove, reprouve*]

re·prove (riprú:v) *pres. part.* **re·prov·ing** *past* and *past part.* **re·proved** *v.t.* to rebuke (someone) [fr. O.F. *reprover*]

rep·tant (réptənt) *adj.* (*biol.*) creeping or crawling [fr. L. *reptans* (*reptantis*)]

rep·tile (réptail, réptil) 1. *n.* a member of *Reptilia,* a class of cold-blooded vertebrates incl. snakes, lizards, crocodiles and turtles etc. They have lungs, a heart with three chambers, and a skin covered with tough scales or plates. Some creep on their bellies, others crawl on very short legs 2. *adj.* of, like or having the characteristics of a reptile **rep·til·i·an** (reptíljən, reptílliə:n) *adj.* and *n.* [fr. L.L. *reptilis,* creeping]

re·pub·lic (ripʌ́blik) *n.* a form of government in which the head of state is an elected president rather than a monarch || a form of government in which the sovereign power is widely vested in the people either directly or through elected representatives || a state with either of these forms of government || a society whose members are equally engaged in the same activity, *the republic of letters* [fr. F. *république* or L. *respublica* fr. *res,* affair +*publicus,* public]

re·pub·li·can (ripʌ́blikən) 1. *adj.* pertaining to, characteristic of or having the nature of, a republic || favoring a republic **Re·pub·li·can** of or belonging to the Republican party 2. *n.* a person who supports the form of government of a republic **Re·pub·li·can** a member of the Republican party

Republican party one of the two main political parties of the U.S.A. (cf. DEMOCRATIC PARTY). It was formed (1854) by antislavery groups to oppose the Kansas-Nebraska Act, and attracted many Whigs, Free-Soilers and those Know-Nothings who opposed slavery. It rapidly gained power in the North and held its first national convention in 1856. Lincoln became the first Republican president (1861). The Republicans held the presidency from then until 1913, with the exception of the administrations (1885-9 and 1893-7) of Cleveland. They were weakened by the secession of the Liberal Republicans (1872) and the Mugwumps (1884). In the late 19th c. the Republican party favored protective tariffs and the gold standard. After the administrations of Theodore Roosevelt and Taft, the secession of the Progressive party split the Republicans (1912). They returned to power (1921-33) under Harding, Coolidge and Hoover, but were blamed for the economic crisis of 1929 and were out of office until the administration (1953-61) of Eisenhower. They lost (1961-9) the presidency, regaining it with the administration (1969-74) of Richard Nixon. Vice President Gerald Ford assumed the presidency following Nixon's resignation but lost the 1976 election to Democrat Jimmy Carter. The Republicans regained the presidency with Ronald Reagan's landslide victory in 1980, and they controlled the Senate for the first time since 1955. Democrats held control of the House through the 1984 elections, when Reagan was reelected

Republic of Ireland *IRISH REPUBLIC

re·pu·di·ate (ripjú:di:eit) *pres. part.* **re·pu·di·at·ing** *past* and *past part.* **re·pu·di·at·ed** *v.t.* to refuse to be concerned with or responsible for (someone) || to refuse to accept (something) as valid or true || to refuse to pay (e.g. a debt or claim) [fr. L. *repudiare* (*repudiatus*), to divorce]

re·pu·di·a·tion (ripju:di:éiʃən) *n.* a repudiating or being repudiated [fr. L. *repudiatio* (*repudiationis*)]

re·pug·nance (ripʌ́gnens) *n.* extreme dislike, aversion [F. *répugmance* or fr. L. *repugnantia*]

re·pug·nant (ripʌ́gnənt) *adj.* producing the feeling of repugnance [F. or fr. L. *repugnans* (*repugnantis*)]

re·pulse (ripʌ́ls) *n.* a repulsing or being repulsed [fr. L. *repulsa* or *repulsus* fr. *repellere* (*repulsus*), to drive back]

repulse *pres. part.* **re·puls·ing** *past* and *past part.* **re·pulsed** *v.t.* to drive back by force || to refuse or reject, *to repulse an offer of help* || to fill

with repulsion [fr. L. *repellere* (*repulsus*), to drive back]

re·pul·sion (ripʌ́lʃən) *n.* a repulse || a feeling of repugnance || (*phys.*) the force tending to drive two bodies further apart [fr. L. L. *repulsio* (*repulsionis*)]

re·pul·sive (ripʌ́lsiv) *adj.* causing feelings of repulsion || (*phys.*) tending to repel [REPULSE v.]

rep·u·nit (répju:nit) *n.* (*math.*) a number consisting entirely of integers, 11, 111, etc., or 99, 999, etc.

re·pur·chase (ri:pə́:rtʃəs) *pres. part.* **re·pur·chas·ing** *past* and *past part.* **re·pur·chased** 1. *v.t.* to buy back 2. *n.* a repurchasing

rep·u·ta·bil·i·ty (repjutəbíliti:) *n.* the state or quality of being reputable

rep·u·ta·ble (répjutəb'l) *adj.* having a good reputation || reliable, *a reputable source* **rép·u·ta·bly** *adv.* [fr. older *repute,* to consider fr. F. *réputer* or L. *reputare*]

rep·u·ta·tion (repjutéiʃən) *n.* the general opinion held by people about the merits or demerits of a person or thing || the state or fact of being highly thought of or esteemed || the good name of a person or thing earned through merit and distinction || (usually with 'of') a specified manner, quality etc. generally ascribed to someone or something, *he has the reputation of being an excellent horseman* [fr. L. *reputatio* (*reputationis*), consideration]

re·pute (ripjú:t) 1. *n.* reputation, esp. good reputation, *a writer of repute* 2. *v.t. pres. part.* **re·put·ing** *past* and *past part.* **re·put·ed** (esp. used passively) to consider, accord a certain character etc. to, *he is reputed to be rich* **re·pút·ed** *adj.* held in high esteem || generally supposed, *its reputed origin goes back to Roman times* **re·pút·ed·ly** *adv.* by or according to reputation [fr. older *repute,* to consider fr. F. *réputer* or L. *reputare*]

re·quest (rikwést) *n.* an act of requesting something or an instance of this || something requested || the fact or state of being requested, *available on request* **by request** because of or following a request or requests **in request** asked for by many persons, popular [O.F. *requeste*]

request *v.t.* attempt to obtain (something) by making one's wants or desires known in speech or writing || to attempt to get (someone) to do or give something that one wants by making this known in speech or writing || to attempt in speech or writing to obtain permission (to do something) [fr. O.F. *requester*]

req·ui·em (rékwi:əm, ri:kwi:əm) *n.* a Mass for the repose of a deceased person || the musical setting of such a Mass [L., accusative of *requies,* rest (the first word of the introit of the Roman Catholic requiem)]

re·quire (rikwáiər) *pres. part.* **re·quir·ing** *past* and *past part.* **re·quired** *v.t.* to stipulate, *the law requires that the report must be made annually* || to place an obligation on (someone), *the law requires you to report annually* || to need, *this requires careful consideration* **re·quire·ment** *n.* something stipulated or demanded || something needed [O. F. *requerre* (*requer-, requier-*)]

req·ui·site (rékwizit) 1. *adj.* required 2. *n.* something required or necessary [fr. L. *requirere* (*requisitus*)]

req·ui·si·tion (rekwizíʃən) 1. *n.* a formal taking of control over goods or services under authority, esp. by an army in the field or by the State in a war or other catastrophe || the condition of being taken over for use in this way, *to be on requisition* || a written request or formal demand for goods or supplies under a centralized system of supply 2. *v.t.* to take control of under authority, *to requisition a house* || to require (someone or something) to provide, *households were requisitioned to provide shelter for the victims* || to request (goods, supplies etc.) under a centralized system of supply [F. *réquisition* or L. *requisitio* (*requisitionis*)]

re·quit·al (rikwáit'l) *n.* a requiting or being requited || something given in return for services or retaliation

re·quite (rikwáit) *pres. part* **re·quit·ing** *past* and *past part.* **re·quit·ed** *v.t.* to repay (someone) for a benefit, injury etc. || to give (something) in return for a benefit, injury etc., *to require good for evil* [fr. RE- + *quite,* var. of QUIT]

re·ra·di·a·tion (ri:reidi:éiʃən) *n.* (*communications*) unwanted radio signals in a receiving instrument

re·ra·di·a·tive (ri:réidi:ətiv) *adj.* having the ability to reflect radiation

rere·dos (ríərdɒs) *n.* an ornamental screen behind an altar [A.F. fr. *rere,* back + *dos,* back]

re·run 1. (ri:rʌ́n) *v. pres part.* **re·run·ning** *past* **re·ran** (ri:ræn) *past part.* **re·run** *v.t.* to run (esp. a race, movie or television show) again 2. (ri:rʌn) *n.* a replayed T.V. show || the public showing of a movie after withdrawing it from circulation for a time, or the movie itself

Re·sa·ca de la Pal·ma (resákaðelapálma), a valley of the Rio Grande in Texas, site of the second battle (1846) of the Mexican War. Mexican troops under Gen. Mariano Arista, retreating south after the battle of Palo Alto, were defeated by U.S. forces under Gen. Zachary Taylor

re·sale (rí:seil, ri:séil) *n.* a selling again or an instance of this

re·scind (risínd) *v.t.* to cancel (a previous decision, regulation etc.) **re·scind·a·ble** *adj.* [fr. L. *rescindere*]

re·scis·sion (risíʒən) *n.* the act of rescinding [fr. L. *rescissio* (*rescissionis*)]

re·scis·so·ry (risísəri:, risíʒəri:) *adj.* rescinding [fr. L.L. *rescissorius*]

re·script (rí:skript) *n.* (*hist.*) a written reply by a Roman emperor or a pope to a question of jurisprudence || any official order or announcement by a ruler or government || a rewriting || something rewritten [fr. L. *rescribere* (*rescriptus*), to rewrite, to write back]

res·cue (réskju:) 1. *pres. part.* **res·cu·ing** *past* and *past part.* **res·cued** *v.t.* to deliver from danger, harm, evil, violence, imprisonment etc. or the threat of any of these || (*law*) to free from legal custody by force 2. *n.* the act of rescuing || (*law*) release by force from legal custody [O.F. *rescourre*]

re·search (risə́:rtʃ) *v.i.* to engage in research [fr. obs. F. *recercher*]

research (risə́:rtʃ, rí:sə:rtʃ) *n.* a systematic search for facts || scientific investigation [fr. obs. F. *recherche*]

re·seat (ri:sí:t) *v.t.* to seat (oneself, a person) again || (*mech.*) to refit in its setting, *to reseat a valve* || to provide (a chair) with a new seat

re·sect (risékt) *v.t.* (*surg.*) to remove a portion of (an organ etc.) [fr. L. *resecare* (*resectus*), to cut off]

re·se·da (risí:də) *n.* a member of *Reseda,* fam. *Resedaceae,* a genus of plants including mignonette, chiefly native to the Mediterranean region, having cleft petals and numerous stamens in their racemose flowers || (also rézidə) the greenish-yellow color of some mignonette flowers [fr. L. *resedare,* to assuage (fr. the use of the plants as a charm for curing tumors)]

re·seg·re·ga·tion (ri:segrigéiʃən) *n.* to segregate after having desegregated

re·sem·blance (rizémbləns) *n.* the state, fact or quality of resembling, similarity

re·sem·ble (rizémb'l) *pres. part.* **re·sem·bling** *past* and *past part.* **re·sem·bled** *v.t.* to be similar to, have the same appearance or nature as [fr. O.F. *resembler*]

re·sent (rizént) *v.t.* to take strong exception to (what is thought to be unjust, interfering, insulting, critical etc.) **re·sént·ful** *adj.* **re·sént·ment** *n.* [fr. F. *ressentir,* to feel the result of]

res·er·va·tion (rezərvéiʃən) *n.* a reserving || something that is reserved || a limitation or qualification, *mental reservation* || (*eccles.*) the practice of keeping in the sanctuary a portion of the consecrated Host || (*eccles.*) the keeping back of the right of granting absolution in certain cases || the engaging in advance of a hotel room, theater seat etc. || a record of such an engaging || a tract of land set aside for some special use [O.F.]

re·serve (rizə́:rv) *n.* something set aside for future use || limitation, reservation or qualification, *to accept a statement with reserve* || an instance of this || avoidance of familiarity in social relationships || self-restraint in action or speech || (in religious instruction and casuistry) suppression of a part of the truth || (*mil.,* usually pl.) troops temporarily withheld from action so that they may be available for special use || (*mil.*) the trained men of a country not in active service, but subject to call in case of war or emergency || one of these men || (*finance*) profit added to capital rather than being paid out to shareholders || (*banking*) assets kept available as cash || (*central banks*) assets held as gold or foreign exchange || a reservation (tract of land) **in reserve** put aside for future use without

APPENDIX F

THE
NEW LEXICON
WEBSTER'S
DICTIONARY
OF THE ENGLISH LANGUAGE

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with an offensive smell 2. *n.* a strong, foul smell **to make** (or **raise** or **cause**) **a stink** to cause trouble, esp. in public over something offensive or supposedly offensive [O.E. *stincan*]

stink bomb a small bomb which emits an evil smell when made to explode

stink-bug (stínkbʌg) *n.* any of several insects, esp. of fam. *Pentatomidae*, which emit a foul smell

stink-horn (stínkhɔrn) *n.* any of several foul-smelling fungi of the order *Phallales*

stink-ing (stínkiŋ) 1. *adj.* foul-smelling ‖ (*pop.*) very objectionable 2. *adv.* (*pop.*) to an extreme degree, *stinking rich*

stink-pot (stínkppt) *n.* (*hist.*) a pot of burning sulfur hurled on the deck of an enemy vessel

stint (stint) 1. *v.t.* to be parsimonious with (something), *don't stint the paint* ‖ to limit (someone) parsimoniously or with frugality, *they stint themselves to buy books* ‖ *v.i.* to be sparing in giving 2. *n.* limitation, *he gives without stint* ‖ an allotment or period of work, *he has done his stint for today, he did his stint in the army* [O.E. *styntan*, to blunt]

stipe (staip) *n.* (*biol.*) a short stalk, stem or stemlike support, e.g. the stem-bearing pileus in agaric fungi, the stalk of seaweeds etc. [F.]

sti-pel (stáipˀl) *n.* (*bot.*) the stipule of a leaflet [Mod. L. *stipella* dim. of *stipula*, a stalk]

sti-pend (stáipend) *n.* a fixed, usually moderate sum of money paid, e.g. to a clergyman, at regular intervals for services rendered [O.F. *stipende, stipendie* fr. L.]

sti-pen-da-ry magistrate (staipéndəri:) (*Br.*) a paid magistrate who is a qualified lawyer and who exercises duties similar to those of a justice of the peace

sti-pen-di-ar-y (staipéndi:ɛri:) 1. *adj.* working for, or receiving, a stipend ‖ (of services) paid for by a stipend 2. *pl.* **sti-pen-di-ar-ies** *n.* (*Br.*) a stipendiary magistrate [fr. L. *stipendiarius*]

sti-pes (stáipi:z) *pl.* **stip-i-tes** (stípiti:z) *n.* (*zool.*) a stemlike part, esp. the second segment of a maxilla in insects and crustaceans [L.]

stip-ple (stipˀl) 1. *v.t. pres. part.* **stip-pling** *past* and *past part.* **stip-pled** to cover with dots (in drawing, engraving, painting etc.) in order to shade or make gradations of tone 2. *n.* this method of work ‖ the effect produced in this work ‖ a thin layer of paint applied over another color, allowing the ground color to show through in many places [Du. *stippelen* fr. *stippen*, to speckle]

stip-u-late (stípjuleit) *pres. part.* **stip-u-lat-ing** *past* and *past part.* **stip-u-lat-ed** *v.t.* to state as a condition for reaching an agreement ‖ to specify, *to stipulate a date* ‖ *v.i.* (with 'for') to state a demand or requirement, *we stipulated for the use of marble* [fr. L. *stipulari* (*stipulatus*)]

stip-u-late (stípjulit) *adj.* having stipules [fr. Mod. L. *stipulatus*]

stip-u-la-tion (stipjuléiʃən) *n.* a stipulating ‖ something stipulated [L. *stipulatio* (*stipulationis*)]

stip-u-la-tor (stípjuleitər) *n.* someone who stipulates [L.]

stip-ule (stípju:l) *n.* one of two leaflike or membranous processes developed at the base of a leaf, sometimes modified into a tendril or spine [F.]

stir (stəːr) 1. *v. pres. part.* **stir-ring** *past* and *past part.* **stirred** *v.t.* to give relative motion to the parts of (a fluid or semifluid), usually by moving an implement through it with a continued rotary motion in order to make the composition homogeneous ‖ to cause (something added) to form a uniform mixture with that to which it is added, *to stir pigment into paint* ‖ (esp. with 'up') to cause to rise by stirring or as if by stirring, *his dive stirred up some mud, to stir up trouble* ‖ to cause to move, esp. to change the position of very slightly, *the breeze stirred the leaves* ‖ to cause to act, feel or think, *the news stirred him to action, to stir the imagination* ‖ to arouse strong emotions of an idealistic kind in ‖ *v.i.* to begin to move, *nobody stirred before daybreak* ‖ to move a little, *he stirred slightly in his sleep* ‖ to move, *he did not stir while you were gone* ‖ to be able to be stirred, *the glaze does not stir easily* ‖ to begin to develop, *discontent is stirring among the farmers* 2. *n.* the act of stirring ‖ a slight movement among things, persons etc., *a stir in the audience* ‖ a state of excitement, *he created a stir by his behavior* [O.E. *styrian*]

Stir-ling (stəːrliŋ) a county (area 451 sq. miles, pop. 195,000) in central Scotland ‖ its county town (pop. 38,638), with a medieval castle, res-

idence of many Scottish monarchs (12th c.-1603)

stir-ring (stəːriŋ) *adj.* arousing strong emotions of an idealistic kind

stir-rup (stírəp, stəːrəp) *n.* a footrest for a horseman, usually a loop of iron, suspended by a strap from the saddle ‖ a clamp or support having a similar U-shape [O.E. *stigrāp*]

stirrup bone the stapes

stirrup cup a drink handed as a farewell gesture to a mounted horseman before he rides away

stirrup iron the iron part of a riding stirrup

stirrup leather the adjustable leather strap of a stirrup

stirrup pump a small hand pump with a stirrup support and a short hose attached. The pump is placed e.g. in a bucket of water and is used to put out small fires

stish-o-vite [SiO₂] (stíʃəvait) a dense polymorph of quartz created under pressure believed of extraterrestrial origin; named for S. M. Stishov, Russian mineralogist. It was discovered by Edward Ching Te-Cha and others in 1962

stitch (stitʃ) 1. *n.* one in-and-out passage of a thread through a fabric in sewing or embroidering ‖ the piece or loop of thread left in the material by this action ‖ one turn of the wool etc. around the needle or hook in knitting, crocheting etc. ‖ the resulting loop in the knitted or crocheted fabric ‖ a particular style of making such loops in sewing, embroidering, knitting or crocheting ‖ (*pop.*, always neg., or quasi-neg.) a bit, the least bit, *he hasn't done a stitch of work, hardly a stitch of clothing on* ‖ one in-and-out passage of a needle threaded with catgut, wire etc. used by a surgeon in closing a wound ‖ one of the loops of catgut, wire etc. so made ‖ a sudden sharp pain in the side **in stitches** in helpless laughter 2. *v.t.* (often with 'up') to fasten, repair, make or ornament with stitches ‖ to staple (folded printed sheets) for binding ‖ *v.i.* to sew [O.E. *stice*]

sto-a (stóuə) *pl.* **sto-ae** (stóui:), **sto-as** *n.* (*archit.*) an ancient Greek portico [Gk]

stoat (stout) *pl.* **stoats, stoat** *n.* the European ermine, esp. in its brown, summer coat [etym. doubtful]

sto-chas-tic (stəkÆstik) *adj.* pertaining to chance or conjecture ‖ (*math.*) random [fr. Gk *stochastikos* fr. *stochazesthai*, to aim at a target, guess]

stochastic process (*math.*) in probability theory a system involving time parameters used to define a process utilizing random variables, e.g., of the economy, ecosystem, etc. *also* random process

stock (stpk) 1. *n.* an accumulation of things which is maintained as a constant source of supply, esp. as the basis of a storekeeper's or manufacturer's business ‖ an accumulation of goods for future use, *a stock of provisions* ‖ ancestors, family ‖ a group of animals or plants having the same line of descent ‖ a major racial division of mankind ‖ a group of related languages ‖ shares of corporate capital or their certificates of ownership ‖ the material necessary for running an enterprise, e.g. the tractors, tools, hen houses etc. of a farm ‖ livestock ‖ the raw material from which a manufactured article, e.g. paper, is made ‖ the fixed base or holding part of a tool, weapon, anchor etc. ‖ the wooden part of a rifle by which the barrel is held ‖ the butt of a whip ‖ the estimation in which a thing or person is held, *his stock has gone up* ‖ (*pl., naut.*) a wooden framework supporting the hull of a ship being built or repaired on land ‖ (*pl., hist.*) a wooden frame with holes for confining the ankles (and sometimes the wrists) of a wrongdoer sentenced to be exposed in this way to public view and ridicule ‖ liquid in which bones, meat, fish or vegetables have been simmered, used as a basis for soups, sauces etc. ‖ a theatrical stock company ‖ the plays presented by a stock company ‖ a piece of cotton or silk material worn over the chest with a stiff white collar by some priests and clergymen ‖ (*hist.*) a wide cravat wrapped twice around the neck and looped in front in a loose knot ‖ a similar cravat worn as part of a riding outfit ‖ a member of *Matthiola*, fam. *Cruciferae*, a genus of plants bearing fragrant, four-petaled flowers on long stalks ‖ (*zool.*) a colony of zooids connected to form a compound organism ‖ a hive of bees ‖ the stem of a tree or bush into which a graft is inserted ‖ a plant from which cuttings are prepared ‖ the trunk of a tree or stem of a plant **in stock** manufactured and available for

purchase **off the stocks** (of a ship) launched ‖ completed **on the stocks** (of a ship) being built ‖ in progress, *he has two novels on the stocks* **out of stock** not available for purchase because current stocks are exhausted **to take stock** to check the number, condition etc. of what is in supply ‖ to make an inspection so as to assess resources etc. 2. *v.t.* to furnish with a supply, *he stocked his shop with canned foods* ‖ to have and be able to supply, *he does not stock that kind of food* ‖ to furnish (a tool, weapon etc.) with a stock ‖ to furnish (a farm) with stock ‖ to accumulate a supply of ‖ *v.i.* (esp. with 'up') to take in stocks esp. of manufactured goods 3. *adj.* always maintained in stock ‖ pertaining to the recording or handling of a stock, *stock clerk* ‖ (of an argument, answer etc.) usually used, not original ‖ relating to a theatrical stock company ‖ (of an animal) used to breed a strain ‖ (of a farm) devoted to breeding [O.E. *stoc, stocc*]

stock-ade (stpkéid) 1. *n.* a fortification consisting of a fence of posts set firmly and close together ‖ any strong enclosure fenced in by posts in this way 2. *v.t. pres. part.* **stock-ad-ing** *past* and *past part.* **stock-ad-ed** to furnish with a stockade [F. *estacade* fr. Span.]

stock-brok-er (stpkbroukər) *n.* someone who deals in stocks and shares **stock-brok-er-age** (stpkbroukərid3) *n.* stockbroking **stock-brok-ing** *n.* the business of a stockbroker

stock-car (stpkkɑr) *n.* (*rail.*) a car for transporting livestock

stock car a standard make of car with a supercharged engine used for racing in competition with similar cars

stock company a company the capital of which is subscribed by, or owned by, stockholders or shareholders ‖ a permanent company of repertory actors usually having its own theater

stock exchange a place where stocks are bought and sold ‖ a regulated association of stockbrokers for the business of buying and selling stocks

stock-fish (stpkfiʃ) *pl.* **stock-fish, stock-fish-es** *n.* a fish cured in the open air without salt [prob. fr. Du. *stokvisch*]

Stock-hau-sen (stókhauz'n), Karlheinz (1928-), German composer, a leading exponent of serial music

stock-hold-er (stókhouldər) *n.* a person who owns stock (shares of corporate capital)

Stock-holm (stókhoum) the capital (pop. 1,512,200 with agglom. 1,145,000) and commercial and industrial center of Sweden, on a cluster of islands and peninsulas where Lake Mālar joins the Baltic. Industries: iron and steel, mechanical and electrical engineering, chemicals, oil refining, metalwork, textiles, printing and publishing. The old city (13th-c. churches, 18th-c. royal palace) is on the central islands, surrounded by modern quarters cut by canals and gardens. University (1877), national museums. Stockholm was founded in the 13th c. and became the capital in the 17th c.

stock-i-ly (stókili:) *adv.* in a stocky manner **stock-i-ness** (stóki:nis) *n.* the state or quality of being stocky

stock-i-net, stock-i-nette (stpkinét) *n.* a machine-knitted cotton fabric with some elasticity, used esp. for underwear

stock-ing (stókiŋ) *n.* a close-fitting covering for the foot and leg knit in nylon, silk, wool, cotton or other fiber **in one's stocking feet** wearing stockings, but no shoes

stocking cap a long knitted cap tapering at the end and finished off with a pom-pom

stocking mask a nylon stocking worn over the face to conceal identity, e.g., for use in a robbery

stock-in-trade (stókintréid) *n.* the goods, equipment etc. of a shop or business

stock-ist (stókist) *n.* (*Br.*) someone who keeps a supply of specified goods for sale

stock-job-ber (stókd3pbər) *n.* a stockbroker, esp. an unscrupulous one ‖ (*Br.*) someone who acts as an intermediary between a broker selling and a broker buying. He often speculates by buying on the rise

stock-man (stókmən) *pl.* **stock-men** (stókmən) *n.* a man who owns or raises livestock ‖ (stókmæn) a man who keeps records of stock or gives out supplies, e.g. in a warehouse ‖ (*Br.* and *Austral.*) someone who herds livestock, esp. sheep or cattle

stock market a stock exchange ‖ the buying and selling of stocks and shares

stock-pile (stókpail) 1. *n.* a reserve, esp. of essential matériel accumulated for use when the

APPENDIX G

37 CFR 1.76

US.03   **FORM FOR ENTERING THE NATIONAL PHASE.** The USPTO has available a special form for the transmittal of the fees and documents required for entering the national phase (see Annex US.II). This form should preferably (but need not) be used, however, see paragraph US.05, below. Together with the special form indicated above, applicants may also submit an "application data sheet" containing bibliographic data. The submission of an application data sheet is voluntary. The "application data sheet" facilitates electronic capture of the bibliographic data by the USPTO, thus leading to more accurate data recording and quicker processing by eliminating the need to have this data manually extracted from the application papers. A guide to preparing an application data sheet, along with the necessary software for preparing the application data sheet, can be found at the USPTO's website *www.uspto.gov* by clicking on "Patents" then in the "Applications" column, clicking on "PrintEFS."

APPENDIX H

FORM PTO-1390 (REV. 12-2001)	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER 717901.20

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (If known, see 37 CFR 1.5
10/039,565

INTERNATIONAL APPLICATION NO. PCT/GB00/02413	INTERNATIONAL FILING DATE June 21, 2000	PRIORITY DATE CLAIMED June 22, 1999

TITLE OF INVENTION
COMPUTER NETWORK PAYMENT SYSTEM

APPLICANT(S) FOR DO/EO/US
Andrew Mark Stringer

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. [X] This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.

2. [ ] This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.

3. [ ] This is an express request to begin national examination procedures (35 U.S.C. 371(f)). The submission must include items (5), (6), (9) and (21) indicated below.

4. [ ] The US has been elected by the expiration of 19 months from the priority date (Article 31).

5. [ ] A copy of the International Application as filed (35 U.S.C. 371(c)(2))
    a. [ ] is attached hereto (required only if not communicated by the International Bureau).
    b. [ ] has been communicated by the International Bureau.
    c. [ ] is not required, as the application was filed in the United States Receiving Office (RO/US).

6. [ ] An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
    a. [ ] is attached hereto.
    b. [ ] has been previously submitted under 35 U.S.C. 154(d)(4).

7. [ ] Amendments to the claims of the International Aplication under PCT Article 19 (35 U.S.C. 371(c)(3))
    a. [ ] are attached hereto (required only if not communicated by the International Bureau).
    b. [ ] have been communicated by the International Bureau.
    c. [ ] have not been made; however, the time limit for making such amendments has NOT expired.
    d. [ ] have not been made and will not be made.

8. [ ] An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).

9. [ ] An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).

10. [ ] An English lanugage translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 20 below concern document(s) or information included:

11. [X] An Information Disclosure Statement under 37 CFR 1.97 and 1.98.

12. [ ] An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.

13. [X] A FIRST preliminary amendment.

14. [ ] A SECOND or SUBSEQUENT preliminary amendment.

15. [ ] A substitute specification.

16. [ ] A change of power of attorney and/or address letter.

17. [ ] A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821 - 1.825.

18. [ ] A second copy of the published international application under 35 U.S.C. 154(d)(4).

19. [ ] A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).

20. [X] Other items or information: *Return Receipt Postcard*

21.☐ The following fees are submitted:

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)):

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO **$1040.00**

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO **$890.00**

International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO **$740.00**

International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) **$710.00**

International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) **$100.00**

CALCULATIONS   PTO USE ONLY

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	CALCULATIONS	PTO USE ONLY
ENTER APPROPRIATE BASIC FEE AMOUNT =	$	
Surcharge of $130.00 for furnishing the oath or declaration later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(e)).	$ 890.00	

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	$	
Total claims	15 - 20 =	0	x $18.00	$	
Independent claims	4 - 3 =	1	x $84.00	$ 84.00	
MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+ $280.00	$	
TOTAL OF ABOVE CALCULATIONS =				$ 974.00	
☒ Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2. +				$ 487.00	
SUBTOTAL =				$ 487.00	
Processing fee of $130.00 for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				$	
TOTAL NATIONAL FEE =				$	
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). $40.00 per property +				$	
TOTAL FEES ENCLOSED =				$ 487.00	
				Amount to be refunded:	$
				charged:	$ 487.00

a. ☐ A check in the amount of $ _____ to cover the above fees is enclosed.

b. ☒ Please charge my Deposit Account No. ___11-0160___ in the amount of $ ___487.00___ to cover the above fees. A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. ___11-0160___. A duplicate copy of this sheet is enclosed.

d. ☐ Fees are to be charged to a credit card. **WARNING:** Information on this form may become public. **Credit card information should not be included on this form.** Provide credit card information and authorization on PTO-2038.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

Kevin M. Kercher
Blackwell Sanders Peper Martin LLP
720 Olive St., Suite 2400
St. Louis, MO 63101

_____
SIGNATURE

___Kevin M. Kercher___
NAME

33,408
_____
REGISTRATION NUMBER